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THE EFFECT OF LITHIUM CHLORIDE ON THE MORPHOLOGY OF STREPTOCOCCUS SCARLATINAE

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A marked pleomorphism of certain bacterial species is readily induced by aging or growing them in media that are more or less unfavorable. These "involution forms," formerly so-called, are no longer regarded by many competent bacteriologists as abnormal, retrograde, or degenerative bodies. The studies of Almquist (1), Enderlein (2), Lohnis (3), Hort (4), Mellon (5), and Hadley (6), to mention only a few, suggest that these forms represent normal phases or stages in the life cycle of the species. Lohnis, in studies upon *Azotobacter*, found that this organism "may present itself in not less than 14 types of growth all so different from each other that they would have to be accepted as separate species belonging to five or six different genera."

The addition of 0.5 or 1 per cent lithium chloride to the media has been found by many investigators to be a simple and effective means of inducing these pleomorphic changes after only a few hours' incubation. For example, Kuhn (7) has described the so-called "Pettenkoferiaformen" when cholera vibrios were grown in the presence of lithium chloride, and Hadley and his coworkers in their studies upon the filterable forms of *B. dysenteriae* (Shiga) induced by the addition of lithium chloride to the broth media have also noted many rod forms that appear to be undergoing granulations as well as enlarged cells usually round or oval and referred to as "balloon" bodies, with a diameter of 2 to 7 micra. Hadley believed these forms to be similar to the Pettenkofer bodies of Kuhn.

In studies of the *Salmonella* group of organisms Gray (8) has called attention to "involution forms" of swollen rods or coccoid bodies developing in the presence of lithium chloride broth or peptone water which were used as selective media for staphylococci and *B. fecalis alkaligenes*.

B. pestis which produces the classical involution forms in 2 per cent salt agar developed in our hands identical forms in 0.5 per cent lithium chloride broth after a few hours' incubation. Figure 1 is a

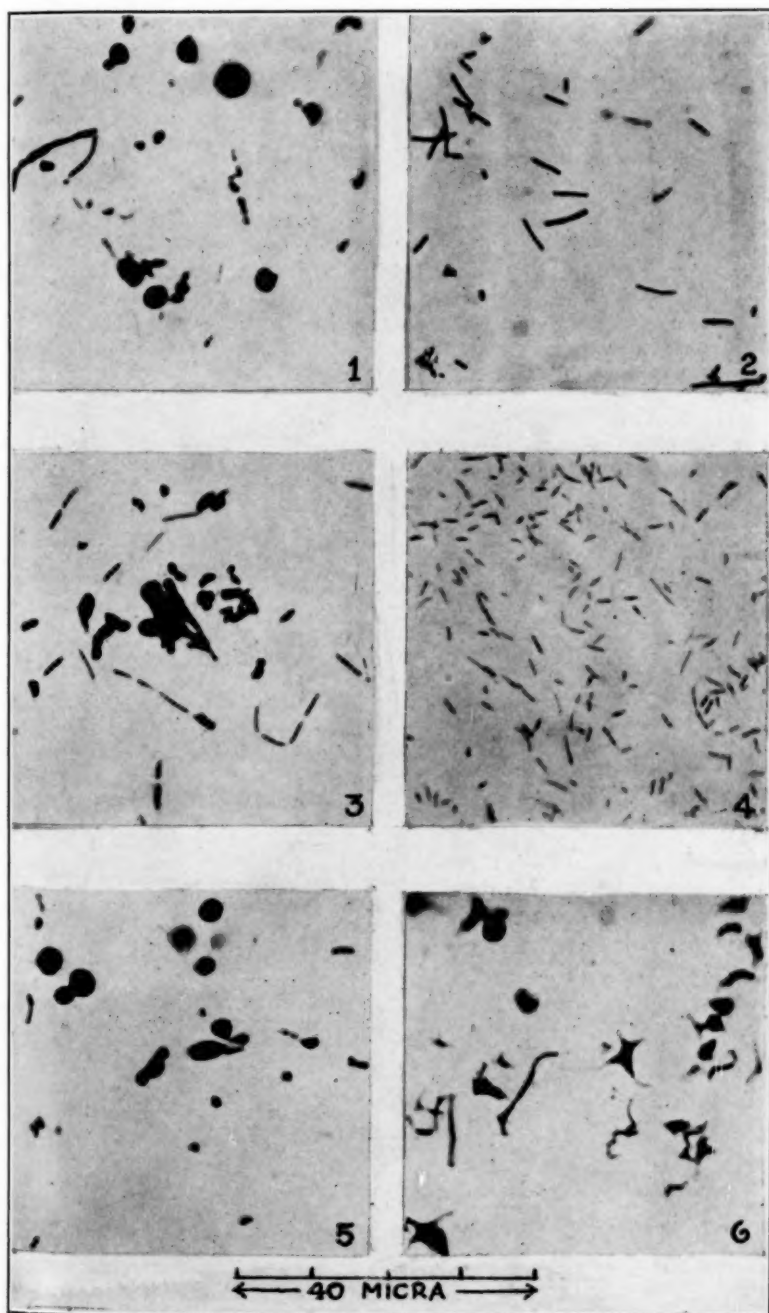
photomicrograph of *B. pestis* after only six hours' growth in lithium chloride broth.

In lithium chloride cultures of *Streptococcus scarlatinae* we have observed almost without exception an abundance of certain ring forms which have been invariably absent from the controls (cultures of the same organism in plain broth) and from lithium chloride cultures of *B. coli*, *B. proteus* X₁₀, and *B. pestis*. Similar forms have been seen, however, in lithium chloride cultures of *Staphylococcus aureus*, but not in cultures of pneumococcus and meningococcus. We have not tested other species of cocci. We consider these forms of sufficient significance to be recorded since they can be produced so readily in lithium broth and, so far as known, have not heretofore been mentioned in the literature; but we have not attempted as yet to interpret their significance. Furthermore, our observations on the development of streptococcus in lithium chloride seem to lend support to the conception of the fusion of two or more individuals, but we are not prepared to say that this is a sexual phenomenon.

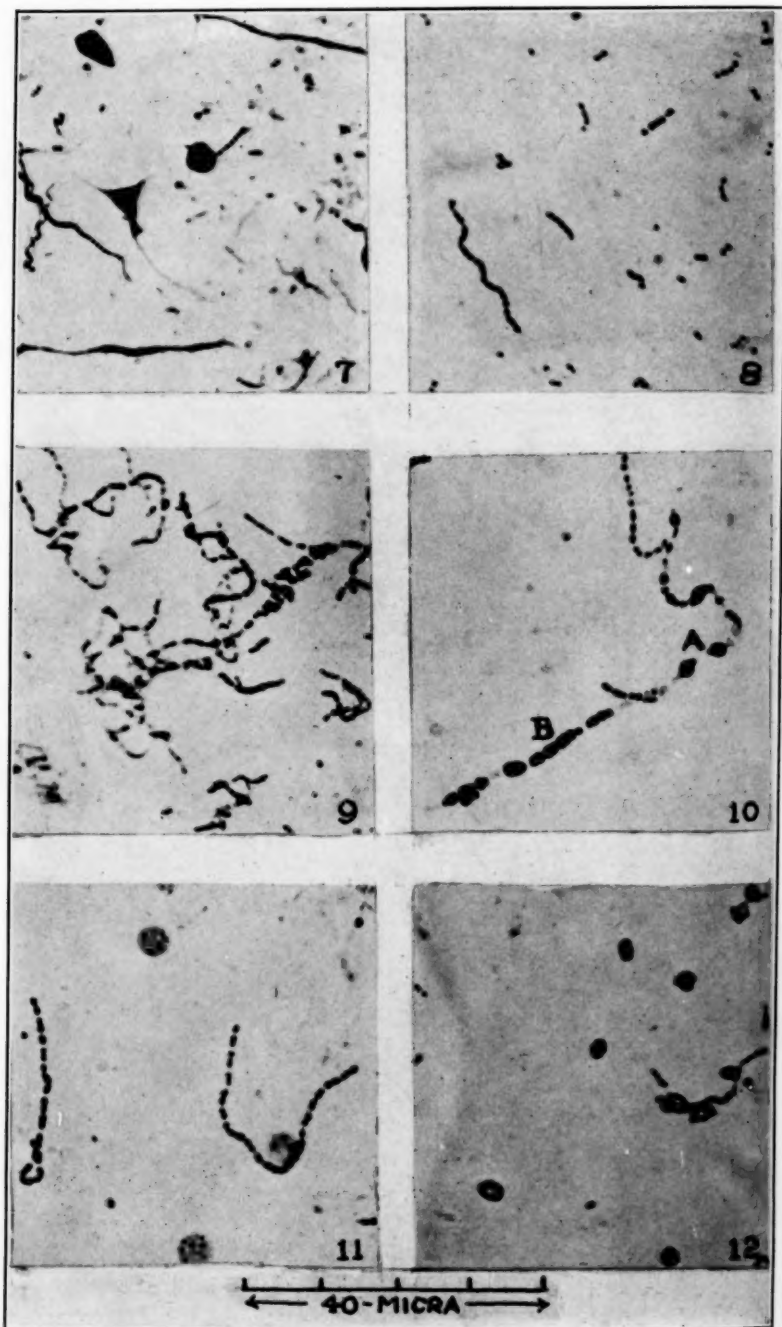
The effect of the chlorides of other salts (potassium, strontium, and magnesium) was also tried upon various organisms, but lithium chloride was by far the best for inducing morphological changes. Figure 3 is a photomicrograph of a 24-hour lithium chloride broth culture of *B. proteus* X₁₀, and Figures 5, 6, and 7 are photomicrographs of cultures of *B. coli* after 1, 2, and 5 days' growth, respectively, in the same media. A very wide range of pleomorphism is observed. One may distinguish cocci, bacilli, filiforms, spirillae, branching rods, triangular forms, and pyramidal shapes, as well as giant ovals and giant cocci. None of these unusual forms is seen in the plain broth control cultures of *B. proteus* X₁₀ (Fig. 2) and *B. coli* (Fig. 4).

Figures 8 and 9 are the control cultures of streptococcus after 2 and 10 days, respectively, in plain broth. There is no pronounced change in morphology. However, Figures 10 to 16, inclusive, represent cultures of the same organism in lithium chloride broth after varying intervals.

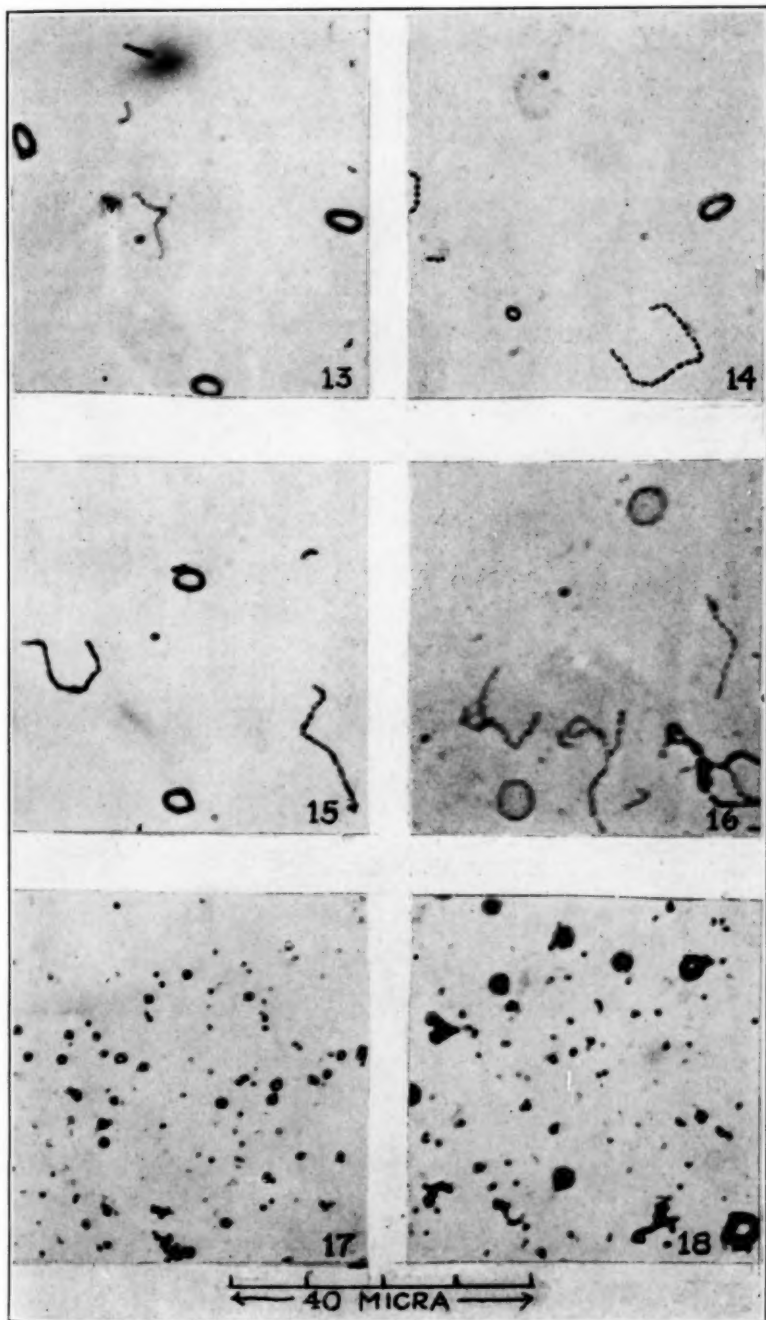
We believe that the streptococcus, because of its chain formation, is a more suitable organism than most others for the study of bacterial fusion, or what some might call "isogamic conjugation" or zygospore formation. In Figure 10 can be seen a chain of streptococci in which giant cocci (zygospores?) are being formed. Along that part of the chain where the individuals are normal in size there are about eight or nine cocci within a distance of 10 micra, while in another section of equal length in the same chain there are only two enlargements (zygospores?) with spaces on either side showing no stainable substance or else mere shadows (A). This same chain of organisms gives the impression (at B) that the enlargement has been formed by the fusion and concentration of the substance of two or more individuals



1, *B. pestis* 6 hours' growth in lithium broth; 2, *B. proteus* X₁₉ 24 hours' growth in plain broth;
3, *B. proteus* X₁₉ 24 hours' growth in lithium broth; 4, *B. coli* 4 days' growth in plain broth;
5, *B. coli* 24 hours' growth in lithium broth; 6, *B. coli* 48 hours' growth in lithium broth



7, *B. coli* 5 days' growth in lithium broth; 8, *Strep. scarlatinae* 2 days' growth in plain broth; 9, *Strep. scarlatinae* 10 days' growth in plain broth; 10, *Strep. scarlatinae* 24 hours' growth in lithium broth; 11, *Strep. scarlatinae* 3 days' growth in lithium broth; 12, *Strep. scarlatinae* 5 days' growth in lithium broth



13, *Strep. scarlatinae* 5 days' growth in lithium broth; 14, *Strep. scarlatinae* 5 days' growth in lithium broth; 15, *Strep. scarlatinae* 5 days' growth in lithium broth; 16, *Strep. scarlatinae* 14 days' growth in lithium broth; 17, *Staph. aureus* 10 days' growth in lithium broth; 18, *Staph. aureus* 10 days' growth in lithium broth

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without breaking the continuity of the chain. In other words, the picture suggests a flow of substance along the axis of the chain to certain points of concentration, thus forming the zygospor (isogamic conjugation?). This appearance is by no means unusual in lithium chloride cultures of the streptococcus with which we worked and has been observed innumerable times.

Figure 11 shows giant cocci separate from the chains and containing small granules which, without proof, we assume to be gonidia or regenerative bodies, described by various workers.

In Figures 12, 13, 14, 15, and 16 we see various sizes of the ring forms, the significance of which is unknown. From a study of numerous preparations we have obtained the impression that some of the rings at least are formed by loops of the normal streptococcic chains, the individual organisms of which subsequently coalesce into an evenly stained protoplasmic ring. On the other hand, in preparations of *Staphylococcus aureus* grown in lithium chloride broth, rings seem to appear as enlargements of a single organism. (Fig. 17.)

In stained preparations the giant cocci and ring forms are brought out better by alcoholic fixation than by heat fixation, which latter method seems to distort or destroy them. The Giemsa stain is also to be preferred.

While our observations strongly suggest that some of these unusual forms are developed by means of the fusion of two or more individual cocci, as yet we have not been able to prove that they are regenerative bodies which give rise to new forms. The actual transformation of the spherical and globular elements into normal forms has been observed in cultures of typhoid and other organisms by Almquist (1). A large number of normal streptococcic chains are always to be found in all lithium chloride cultures, and when transfers are made from such cultures to plain broth the normal streptococcic morphology only is observed. Although the ring forms are abundant in stained smears, when the same cultures are diluted we have not been able to find them in wet preparations where single cell isolation might be performed. Therefore, we can not state that these forms are actual phases of the organism.

That the ring forms are not artefacts is suggested by the fact that they are not seen in control cultures grown in plain broth nor in cultures of other organisms in lithium chloride broth nor in smears of the sterile lithium broth alone. On the other hand, the variability in size of the rings, often seen on the same slide (Figs. 12, 13, and 14 are photomicrographs of different areas of the same smear), the fact that they can not be made out readily in wet preparations, and the fact that they can not be reproduced by transfers are in opposition to the view that they are living phases of the streptococcus.

SUMMARY

1. Lithium chloride broth is a suitable medium for the production of pleomorphism in many bacterial species.
2. Streptococcus, because of its chain formation, lends itself readily to the study of the fusion of individual bacteria.
3. Certain ring forms in streptococcus and staphylococcus broth cultures are described. The significance of these forms is not known.

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CALCIUM, PHOSPHORUS, AND PROTEIN METABOLISM IN LEPROSY

A Study of the Total Calcium, Diffusible and Nondiffusible Calcium, Phosphorus, Total Proteins, Albumin, and Globulin in the Blood Serum

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The growing interest in disturbances of calcium metabolism within recent years has stimulated investigations of the state of calcium in blood serum and its distribution in various body fluids. It is generally considered at the present time that calcium exists in the serum; first, in the ionic form (although the amount ionized is not definitely known); second, as undissociated molecules in equilibrium with the ions; and third, in nonionizable combination with organic constituents. The quantity in the blood serum of the first two forms, termed "diffusible calcium," seems to indicate that this form rather than the total calcium is the better index of the physiologically active or available calcium (1). The last form, termed "nondiffusible," is looked upon as a calcium-protein combination; and while little is known regarding its real nature, the function of this portion may have its own special uses.

Loeb (2) in his interesting work on the Proteins and Theory of Colloidal Behavior, shows the possible existence of compounds of calcium and protein, since proteins at a hydrogen-ion concentration

above their isoelectric point (namely, more alkaline) form compounds with monovalent and divalent cations.

In an investigation of the state of calcium in the blood sera of lepers we (3) found in 53 cases examined, a diminution in the diffusible form and rather a high concentration in the nondiffusible form, although the total content was within physiologic limits. Bones of the hands and feet of 48 of the 53 patients were examined by X ray, and it was found that 44 had atrophy either in the form of decalcification or bone absorption to some degree.

In disease, certain changes in the serum proteins have long been recognized. Changes in the ratio of albumin to globulin have been especially studied. Morse (4) states in substance that, besides nephritis, other diseases exhibit differences in the ratio of globulin to total protein and to albumin, infections and toxemias causing a typical rise in the proportion of globulin, and that an increase in the proportion of globulin to albumin indicates aggravation of the disease.

Peters and Eiserson (5) state: "Salvesen and Linder, in 1923, from a study of the relation of calcium to protein in sera and transudates from patients with nephritis, concluded that the amount of protein in body media also had an important influence upon the concentration of calcium in these media. Since then, Marrack and Thacker have shown that proteins increase the solubility of calcium in true and artificial sera, probably by the formation of un-ionized or only slightly ionized calcium-protein complexes."

Since leprosy is a chronic infectious disease producing pathological changes in many tissues of the body, bones, peripheral nerves, etc., we desired to carry on experiments to see whether there was any regular relationship between the total serum protein, albumin and globulin fractions, diffusible and nondiffusible calcium, and phosphorus in the blood serum in leprosy, or whether an increase in globulin was merely related to the degree of infection and intoxication or that of tissue destruction, independent of the calcium metabolism.

The forty-six patients selected were of various types, nationalities, duration of leprosy, and state of progression, and their sera were analyzed for total calcium, diffusible calcium, inorganic phosphorus, total proteins, albumin and globulin, and the complement fixation.

Due to the various results obtained by different investigators for albumin and globulin which were probably due to variations in the method used, we analyzed concurrently the sera of six young men, physicians who had recently passed rigid physical examinations for entrance into the United States Public Health Service.

ANALYTICAL METHODS

Approximately 20 cubic centimeters of blood was collected for analysis from a cubital vein. The blood was allowed to clot and was centrifuged and the serum was removed from three to four hours after

the specimen had been taken and was preserved at a temperature of 6° to 8° C. The serum for diffusible calcium was dialized within 24 hours. The protein determinations were made within 48 hours, and the other analyses were completed within a week.

The total calcium determinations were made on the serum by Clark-Collip modification of the Kramer-Tisdall method (6); diffusible calcium by a negative pressure filtration described by Moritz (7), the filtrate being tested according to the method of Burk and Greenberg (8) to determine any leakage of protein material through the sac; phosphorus according to the method of Benedict and Theiss (9); total proteins by a micro-Kjeldahl method; albumin by Howe (quoted by Hawk) (10); globulin by subtracting the albumin from the total protein; the complement fixation by Kolmer's quantitative method, run in parallel with Kahn's precipitation test.

TABLE 1.—*Determination for controls*

Control	Protein	Albumin	Globulin	Ratio, albumin/globulin	Calcium, total, mg. per 100 c. c. serum	Diffusible calcium, mg. per 100 c. c. serum	Diffusible calcium	Calcium, nondiffusible, mg. per 100 c. c. serum	Phosphorus, mg. per 100 c. c. serum
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>				<i>Per cent</i>		
JGW.....	7.18	5.50	1.68	1:3.2	10.5	5.4	51.4	5.1	3.0
JGH.....	6.56	4.90	1.66	1:2.9	10.5	5.3	50.4	5.2	4.2
DWN.....	7.81	5.50	2.31	1:2.8	10	5.5	55.0	4.5	3.4
EJR.....	7.18	5.18	2.00	1:2.5	9.8	5.4	56.1	4.4	3.8
ROC.....	8.12	5.84	2.28	1:2.5	10.9	5.3	48.5	5.6	4.1
WEA.....	7.18	4.90	2.28	1:2.1	11	5.5	50.0	5.5	3.8
Minimum.....	6.56	4.90	1.66	1:2.1	9.8	5.3	48.5	4.4	3.0
Average.....	7.34	5.30	2.03	1:2.6	10.4	5.4	51.9	5	3.7
Maximum.....	8.12	5.84	2.31	1:3.2	11	5.5	56.1	5.6	4.2

The normal figures for total protein as given by different investigators have been uniform, 6 to 8 per cent, though the limits for normal values for serum albumin and globulin appear to be fairly wide. The subject of the serum proteins in man has been carefully considered by Rowe (11), who employed the microrefractometric method of Robertson. Rowe found, in a series of 22 normal cases, the serum albumin to vary between 4.6 and 6.7 per cent; the serum globulin between 1.2 and 2.3 per cent; the total serum proteins between 6.5 and 8.2 per cent. The percentage of globulin varies from 16 to 32. Our figures in the controls (Table 1) are comparable with those of Rowe.

The average figures for total calcium, diffusible calcium, and phosphorus agree with our findings in a previous report (3) and with those of other investigators (7) (12).

The data which have been obtained on the blood sera of lepers have been divided into two main groups. The first group includes those cases which show a diffusible calcium content of 50 per cent and over (Table 2); the second group includes cases showing a diffusible calcium content of less than 50 per cent (Table 3).

TABLE 2.—Patients showing a diffusible calcium of 50 per cent and over

No.	Race	Sex	Age	Approximate duration of leprosy	Type	Stage of progression ¹	Activity ²	Proteins	Albumin	Globulin	Ratio, albumin globulin	Calcium, total, mg. per 100 c. c. serum	Calcium, diffusible, mg. per 100 c. c. serum	Diffusible calcium, Per cent	Nondiffusible calcium, mg. per 100 c. c. serum	Phosphorus, mg. per 100 c. c. serum	Comment fixation
664	White	M	21	5	Mixed	A. M. A.	Retg.	7.81	5.63	1.88	1:3.1	9.3	5.0	53.6	4.3	4.1	Positive.
663	White	M	24	5	Mixed	A. M. A.	Imp.	7.18	5.23	1.95	1:3.1	10.9	5.6	51.0	4.4	3.8	Negative.
543	White	F	22	6	Nodular	I. E. A.	Stuy.	7.18	5.18	2.00	1:2.5	8.9	5.0	56.8	4.9	3.4	Negative.
598	White	M	31	9	Mixed	A. F. A.	Imp.	7.71	5.37	2.34	1:2.5	8.7	4.9	56.3	3.8	3.5	Negative.
404	Chinese	M	19	12	Nodular	A. F. A.	Retg.	7.81	5.12	2.69	1:5.0	11	4.2	54.3	4.8	4.1	Negative.
715	White	M	32	7	Mixed	A. F. A.	Imp.	6.25	5.58	2.67	1:1.3	9.7	4.2	54.6	4.5	3.3	Negative.
462	White	M	23	13	Anesthetic	I. M. A.	Stuy.	7.81	4.68	3.13	1:1.3	9.5	4.0	52.6	4.7	2.4	Positive.
672	White	F	27	12	Mixed	A. M. A.	Imp.	8.96	5.23	3.71	1:1.6	10.6	4.9	55.6	4.7	4.5	Positive.
607	Creek	M	38	2	Mixed	I. E. A.	Stuy.	8.34	5.18	3.16	1:1.4	10.4	5.8	50.0	5.0	2.5	Positive.
599	White	M	37	8	Mixed	A. M. A.	Imp.	6.56	4.25	2.31	1:1.8	10.8	6.3	60.0	4.2	3.0	Negative.
722	Negro	M	22	6	Mixed	A. E.	Imp.	6.25	4.02	2.23	1:1.8	10.5	4.3	53.0	4.7	3.3	Negative.
720	White	F	22	5	Mixed	A. M. A.	Stuy.	7.18	4.06	3.12	1:1.3	10	5.6	52.7	5.0	3.3	Negative.
707	White	F	22	8	Mixed	A. E.	Imp.	7.81	4.06	3.75	1:1.0	10.6	5.6	56.0	4.4	1.7	Negative.
	White	F	36	9	Anesthetic	A. E.	Stuy.	7.81	5.18	2.63	1:1.9	10	5.6	56.0	4.4	1.7	Negative.
	Minimum							6.20	3.12	1.88	1:0.6	8.7	4.9	50.0	3.8	1.7	
	Average							7.47	4.50	2.97	1:1.5	10	5.4	54.0	4.6	3.2	
	Maximum							8.96	5.93	4.00	1:3.1	11	6.3	60.0	5.2	4.5	

¹ A. M. A. = Active, moderately advanced.

A. F. A. = Active, far advanced.

I. M. A. = Inactive, moderately advanced.

I. E. A. = Inactive, early.

A. E. = Active, early.

Retg. = Retrograding.

Stuy. = Stationary.

Imp. = Improving.

* Months.

TABLE 3.—Patients showing a diffusible calcium of less than 50 per cent

No.	Race	Sex	Age Years	Approximate duration of epilepsy	Type	Stage of progression	Activity	Pro- teins	Albu- min	Glob- ulin	Ratio, albumin globulin	Calcium, total mg. per 100 c. c. serum	Diffusible calcium mg. per 100 c. c. serum	Nondif- fusible calcium, mg. per 100 c. c. serum	Phos- phorus mg. per 100 c. c. serum	Comple- ment fixation
115	White	M	23	11	Nodular	A. M. A.	Retg.	7.81	3.12	4.69	1:0.6	10.7	4.4	6.3	3.8	Negative.
224	White	F	32	16	Mixed	A. M. A.	Retg.	7.81	2.80	5.01	1:0.5	15.0	5.1	9.9	7.1	Positive.
8	Negro	M	45	16	Nodular	A. M. A.	Retg.	7.81	4.06	3.75	1:1.0	10.5	4.6	5.9	3.4	Negative.
46	White	F	40	17	Anesthetic	A. F. A.	Retg.	10.31	4.68	5.63	1:0.8	10.6	4.2	6.4	3.3	Negative.
156	Chinese	M	37	17	Nodular	A. M. A.	Retg.	8.75	4.76	3.99	1:1.2	11.0	4.2	6.8	2.9	Negative.
265	Negro	M	81	13	Nodular	A. F. A.	Retg.	8.75	4.68	4.07	1:1.0	10.8	5.0	5.8	2.9	Negative.
300	White	M	40	14	Nodular	A. M. A.	Retg.	7.18	4.06	3.12	1:1.3	10.6	4.8	5.8	2.6	Positive.
161	White	M	34	9	Mixed	A. M. A.	Imp.	7.81	3.75	4.06	1:1.0	10.0	4.5	5.5	2.6	Positive.
591	Negro	F	48	9	Mixed	A. M. A.	Stuy.	7.00	3.12	3.44	1:0.9	10.8	4.7	6.1	4.5	Positive.
421	Negro	M	33	7	Mixed	A. F. A.	Retg.	7.18	3.43	3.58	1:0.8	10.5	4.4	7.3	3.0	Negative.
994	White	M	55	4	Mixed	I. M. A.	Stuy.	7.00	3.12	3.75	1:0.9	10.6	4.4	4.5	2.5	Positive.
717	Mexican	M	20	2	Mixed	A. M. A.	Retg.	6.25	3.25	3.00	1:1.0	12.1	4.9	7.2	3.3	Positive.
516	Mexican	M	67	9	Mixed	A. M. A.	Retg.	7.45	3.75	3.50	1:1.1	10.6	5.1	6.5	3.7	Positive.
294	White	M	35	14	Mixed	A. F. A.	Retg.	7.18	3.90	3.43	1:1.1	10.6	4.7	6.0	3.5	Positive.
608	White	M	39	14	Mixed	A. M. A.	Retg.	7.18	3.90	3.43	1:1.1	10.6	4.7	6.0	3.5	Positive.
307	Jew	M	44	19	Mixed	I. E.	Imp.	7.18	3.90	3.43	1:1.1	10.6	4.7	6.0	3.5	Positive.
610	White	M	24	13	Mixed	A. M. A.	Imp.	7.18	3.43	3.75	1:0.9	11.0	4.8	6.2	3.5	Positive.
209	White	M	37	17	Nodular	I. M. A.	Stuy.	11.56	4.80	6.76	1:0.7	11.0	5.0	6.0	3.5	Negative.
665	White	M	26	30	Mixed	A. M. A.	Retg.	6.99	4.06	2.93	1:1.3	10.0	4.6	6.0	3.5	Negative.
426	White	M	30	15	Mixed	A. F. A.	Retg.	8.43	4.65	3.97	1:1.1	10.0	4.7	5.3	2.9	Negative.
670	Negro	M	26	2	Mixed	A. M. A.	Stuy.	6.56	4.10	2.46	1:1.3	11.5	4.0	5.4	4.8	Negative.
667	White	M	26	2	Mixed	I. E.	Stuy.	6.56	4.37	2.81	1:1.5	10.0	4.6	7.5	3.8	Negative.
681	Mexican	M	28	3	Nodular	A. M. A.	Imp.	7.18	4.37	2.81	1:1.3	10.0	4.5	6.4	3.3	Positive.
679	White	F	41	6	Mixed	A. M. A.	Stuy.	6.56	3.87	2.50	1:1.4	10.7	4.7	5.5	3.5	Positive.
682	White	F	42	18	Mixed	A. M. A.	Retg.	9.62	5.93	3.69	1:1.5	9.3	4.3	6.0	3.6	Positive.
456	Mexican	F	34	15	Anesthetic	I. M. A.	Stuy.	7.62	4.65	2.97	1:1.6	10.0	4.8	5.2	4.1	Negative.
668	White	F	71	11	Mixed	A. M. A.	Stuy.	7.62	4.65	2.97	1:1.5	10.6	4.9	48.0	3.1	Negative.
674	White	M	72	4	Mixed	A. M. A.	Imp.	7.30	4.65	2.65	1:1.7	10.9	4.8	6.1	3.5	Positive.
439	White	M	34	10	Mixed	A. M. A.	Imp.	6.56	4.25	2.31	1:1.8	10.1	4.8	5.3	3.1	Negative.
673	White	M	23	2	Mixed	I. E.	Imp.	6.99	4.68	2.31	1:2.0	10.5	4.7	4.8	3.3	Negative.
713	Chinese	M	33	3	Mixed	A. M. A.	Stuy.	6.65	3.22	3.43	1:0.9	10.8	5.2	5.6	3.1	Positive.
Minimum								6.25	2.80	2.31	1:0.5	9.3	4.0	5.0	2.3	
Average								7.62	4.05	3.57	1:1.1	10.7	4.6	6.1	3.4	
Maximum								11.56	5.93	6.76	1:2.0	15	48.1	9.9	7.1	

Retg. = Retrograding.
Stuy. = Stationary.
Imp. = Improving.

I. A. M. A. = Active, moderately advanced.
A. F. A. = Active, far advanced.
I. M. A. = Inactive, moderately advanced.
I. E. = Inactive, early.
A. E. = Active, early.

The 46 patients represent the following types and stages of progression:

Stage	Type			Total
	Nodular	Mixed	Anes- thetic	
Inactive, early.....	1	4		5
Inactive, moderately advanced.....	1	1	2	4
Active, early.....	1	2	1	4
Active, moderately advanced.....	4	21		25
Active, far advanced.....	2	5	1	8
Total.....	9	33	4	46

The results of Table 2 show that the 14 patients had an approximately normal total calcium and inorganic phosphorus as compared with the controls, with the exception of case No. 707, which shows an inorganic phosphorus content of 1.7 milligrams which is a little low; and case No. 569 showing a total calcium of 8.7 milligrams. The average findings in this series for diffusible calcium were within the normal range, though 6 of the cases were slightly below normal. Of these, 2 were 5.2 milligrams, 3 were 5 milligrams, and 1 was 4.9 milligrams.

In contrast to the constancy of the total protein values, which are all within the normal range of our controls, except in cases Nos. 462 and 569, which are slightly above normal, showing 8.96 and 8.71 per cent, we find in eight cases the globulins increased, with a lowered albumin-globulin ratio. Five of these cases show a negative Wassermann; three were positive. Three cases of the 14 show normal values on all determinations.

The average albumin-globulin ratio on the 14 cases was 1:1.5, as against 1:2.6 of our controls, the lowest ratio being 1:0.6 and the highest 1:3.1, as against 1:2.1 lowest and 1:3.2 highest in the controls.

Seven patients show improvement, 5 are stationary, and 2 show retrogression.

The results presented in Table 3 show that 32 of the 46 patients had a low diffusible calcium, averaging 4.6 milligrams, as against 5.4 milligrams of the controls. The total calcium and total inorganic phosphorus were within physiologic limits in 30 cases; 2 cases showed a high total calcium, No. 234, 15 milligrams, and No. 717, 12.1 milligrams, while case No. 234 also showed a high inorganic phosphorus content of 7.1 milligrams.

It will be noted that in practically all instances the total protein values were within normal limits, with the exception of cases 46, 456, 209, 156, and 265, which showed, respectively, 10.31, 9.62, 11.56, 8.75

and 8.75 per cent. The relationship between albumin and globulin was markedly disturbed. There was a more striking increase in the globulins than in those cases approaching a normal diffusible calcium (Table 2); cases 439 and 673 were the only two within the normal range, showing 2.31 per cent. The albumin-globulin ratio was lower than in the patients having a diffusible calcium content over 50 per cent, averaging 1:1.1, as against 1:1.5. (Table 2.)

Of the 32 cases, none showed normal values throughout all the determinations. Fourteen patients showed retrogression, 9 were stationary, and 9 showed improvement. Nineteen cases showed a positive Wassermann, 11 were negative, and 2 cases were not determined.

In the entire series (Tables 2 and 3) the average findings of inorganic phosphorus, total calcium, and total proteins were well within the normal range except in those cases previously mentioned. (Cases 46, 456, and 209 had a high total protein, and cases 462, 569, 156, and 265 were slightly above normal; cases 234 and 717 had a high calcium content; case 569 had a low calcium content; and case 234 had a high inorganic phosphorus content.)

A very wide range of diffusible calcium was found in the patients' sera; the largest quantity was 6.3 milligrams, while the smallest was 4.0 milligrams per 100 cubic centimeters of serum. The per cent of calcium that was diffusible ranged between 34 and 60. The non-diffusible calcium ranged between 3.8 milligrams and 9.9 milligrams per 100 cubic centimeters of serum.

In the controls the quantity of diffusible calcium ranged between 5.3 milligrams and 5.5 milligrams per 100 cubic centimeters of serum, and the per cent of diffusible calcium was between 48.5 and 56.1. The nondiffusible calcium ranged between 4.4 milligrams and 5.6 milligrams per 100 cubic centimeters of serum.

The globulins and albumin-globulin ratio fluctuated within comparatively wide limits in the patients' sera, the globulins ranging from 1.88 to 6.76 per cent. The albumin-globulin ratio was between 1:0.5 and 1:3.1. In the controls the globulins ranged from 1.66 to 2.31 per cent, and the albumin-globulin ratio from 1:2.1 to 1:3.2.

Of the Wassermanns, 23 were negative, 20 positive, and 3 were not determined.

The duration of leprosy ranged from 8 months to 19 years.

TABLE 4.—Stage of activity values taken from Tables 2 and 3

	Pro- teins, per cent	Albu- min, per cent	Globu- lin, per cent	Ratio, albumin globulin	Calcium, total, mg. per 100 c. c. of serum	Calcium, diffusible, mg. per 100 c. c. of serum	Diffusi- ble cal- cium, per cent	Nondif- fusible calcium, mg. per 100 c. c. of serum	Phos- phorus, mg. per 100 c. c. of serum
16 PATIENTS SHOWING IMPROVEMENT									
Minimum.....	6.20	3.43	1.95	1:0.9	8.7	4.1	28.6	3.8	2.6
Average.....	7.27	4.20	3.06	1:1.3	10.3	5.0	48.5	5.3	3.3
Maximum.....	8.96	5.25	4.34	1:2.1	11.0	6.3	60.0	6.5	4.5
14 PATIENTS THAT ARE STATIONARY									
Minimum.....	6.56	3.12	2.00	1:0.7	9.4	4.0	34.8	4.4	1.7
Average.....	8.50	4.80	3.71	1:1.2	10.4	4.8	46.1	5.4	3.1
Maximum.....	11.56	5.93	6.76	1:2.5	11.5	5.6	56.0	7.5	4.5
16 PATIENTS SHOWING RETROGRESSION									
Minimum.....	6.25	2.80	1.88	1:0.6	9.3	4.2	34.0	4.3	2.3
Average.....	7.71	3.96	3.75	1:1.0	10.9	4.7	43.1	6.2	3.5
Maximum.....	10.31	5.93	5.63	1:3.1	12.1	6.2	56.3	9.9	7.1

Table 4 gives the minimum, average, and maximum findings in the patients showing improvement, remaining stationary, and showing retrogression. The results show variations between the groups into which the cases have been divided. In the lepers showing retrogression the average findings reveal an abnormally low albumin-globulin ratio, with a corresponding decrease in the percentage of diffusible calcium. In the cases that are stationary, the average albumin-globulin ratio is higher, as is also the diffusible calcium. In those cases showing improvement the average albumin-globulin ratio and diffusible calcium were found to be highest.

In general, it appeared that clinical improvement was coincident with a decrease in globulins and the nondiffusible calcium, with an increase in the diffusible calcium and a higher albumin-globulin ratio. The globulins were higher and the diffusible calcium and albumin-globulin ratio were lowest in severe cases, or in those showing retrogression.

DISCUSSION

Many theories have been advanced by various investigators, but few agree as to the cause of muscular and bone changes in leprosy; all are of the opinion, however, that the constant inflammation and infiltration of nerves interfere with nerve function. This appears logical; but, too, our results would seem to show that this constant inflammation, lack of nerve function, muscular and bone changes, may be due in part to a lack of transference to the tissues, of the functionally available and diffusible calcium, which we have found

deficient in the blood sera of lepers. It is thought that probably the disturbance in the protein balance which we have found by our analysis may in some way affect the degree of diffusibility of the available calcium. It seems evident that clinical manifestations of disordered cell function may result from such abnormalities of cell permeability, which may be dependent upon deviations from the normal balance of calcium ions in the blood and tissue.

The consensus of opinion is that the proteins combine with the calcium to form an un-ionized calcium-protein complex. The question may arise as to which constituent of the serum forms the calcium complex. From our results in leprosy, it would seem that the serum globulin bears some relation to the nondiffusible calcium, since in many of the cases we find, first, a rather high nondiffusible calcium with a high serum globulin and a decrease in the diffusible calcium, and, second, a low nondiffusible calcium with a low serum globulin, and a higher diffusible calcium.

It was found, too, that, according to the stage of activity, in those cases showing an improvement the serum globulin and nondiffusible calcium were lower than in those cases showing retrogression. It would seem from these results that the calcium is bound with the serum globulin as infection increases, to form nonavailable calcium. However, these results should not be construed as demonstrating that all of the nondiffusible calcium is bound to the serum globulin, as the physicochemical system of the blood stream is a complex one, and the conditions existing locally in the tissues must be thoroughly understood before we can have a complete knowledge of the mechanism of the so-called mineral balance in the living organism. It is thought, however, that our results would justify further investigation.

SUMMARY

Sera from six normal, healthy young men were examined for total proteins, albumin, globulin, total calcium, diffusible calcium, the per cent of calcium that was diffusible, the nondiffusible calcium, the albumin-globulin ratio, and inorganic phosphorus. Sera from 46 lepers, representing the various types and stages of progression of the disease, were similarly examined, including the use of the complement-fixation test.

The albumin-globulin ratio and the diffusible calcium, as well as the percentage of diffusible calcium, averaged considerably lower in the lepers than in the normal young men; the globulins and nondiffusible calcium averaged higher than in the controls. Three cases showed normal values throughout all determinations as compared with our controls.

A consideration of the results indicates that certain definite changes in the serum proteins and calcium metabolism exist in leprosy, and

suggests that clinical improvement is generally accompanied by a decrease in the percentage of globulin and the nondiffusible calcium, with a corresponding increase in the diffusible calcium and albumin-globulin ratio.

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COURT DECISION RELATING TO PUBLIC HEALTH

Milk laws construed.—(Massachusetts Supreme Judicial Court; *Commonwealth v. Rapoza*, 178 N. E. 530; decided Dec. 2, 1931.) General Laws, ch. 94, sec. 19, provided in part as follows:

No person, himself or by his servant or agent, shall sell, exchange, or deliver, or have in his custody or possession with intent so to do, or expose or offer for sale or exchange * * * milk from which the cream or a part thereof has been removed. * * *

A penalty was provided for violation. The defendant was found guilty under this section of possessing, with intent to sell as pure milk, milk from which a portion of the cream had been removed. It was his contention that he could not properly be convicted because

he had not received the notice required by General Laws, ch. 94, sec. 37. Such section read, in part, as follows:

No producer of milk shall be liable to prosecution for the reason that the milk produced by him is not of good standard quality * * * unless he shall fail to bring the milk produced by him to the legal standard for milk solids and milk fat within 20 days after written notice that it is below said standard has been sent to him by the officer taking said sample. * * *

In rejecting the defendant's contention, the supreme court pointed out that the offense charged in the instant case was not the failure to produce milk of standard quality but the removal of cream therefrom, and stated that it was apparent that section 37 referred to an entirely distinct and different offense from that set forth in section 19. Section 37 was held not to apply to a case where milk had been watered or where the cream had been removed, a difference being recognized between milk naturally deficient and milk made deficient by dilution. "It is obvious," said the court, "that section 37 has no application to section 19, which refers to a case where milk has been tampered with by adding water or any foreign substance or from which cream has been removed."

DEATHS DURING WEEK ENDED JANUARY 23, 1932

Summary of information received by telegraph from industrial insurance companies for the week ended January 23, 1932, and corresponding week of 1931. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended Jan. 23, 1932	Correspond- ing week, 1931
Policies in force.....	74, 199, 865	75, 130, 099
Number of death claims.....	15, 011	15, 115
Death claims per 1,000 policies in force, annual rate.....	10. 6	10. 5
Death claims per 1,000 policies, first 3 weeks of year, annual rate.....	10. 1	11. 0

Deaths¹ from all causes in certain large cities of the United States during the week ended January 23, 1932, infant mortality, annual death rate, and comparison with corresponding week of 1931. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

[The rates published in this summary are based upon mid-year population estimates derived from the 1930 census]

City	Week ended Jan. 23, 1932				Corresponding week, 1931		Death rate ² for the first 3 weeks	
	Total deaths	Death rate ²	Deaths under 1 year	Infant mortality rate ²	Death rate ²	Deaths under 1 year	1932	1931
Total (63 cities).....	8,004	11.5	620	4.52	14.5	862	12.2	14.2
Akron.....	40	7.9	5	62	7.9	6	9.1	8.5
Albany.....	33	13.2	1	20	14.5	3	15.5	15.5
Atlanta.....	72	13.3	7	68	13.9	12	15.9	15.3
White.....	39	10.9	3	44	11.9	6	12.0	13.0
Colored.....	33	18.0	4	115	17.9	6	23.7	19.8
Baltimore.....	241	15.4	17	60	15.9	13	15.0	15.3
White.....	188	14.7	13	59	15.0	7	14.2	14.2
Colored.....	53	18.4	4	64	19.9	6	18.4	19.9
Birmingham.....	50	9.4	2	21	15.9	2	12.1	15.0
White.....	15	4.6	0	0	14.1	2	8.6	11.1
Colored.....	35	17.4	2	54	18.8	0	17.7	21.5
Boston.....	215	14.3	21	63	17.9	18	15.3	16.4
Bridgeport.....	40	14.2	3	53	13.1	1	13.8	13.9
Buffalo.....	143	12.7	11	53	14.4	20	13.3	14.2
Cambridge.....	26	11.9	3	62	13.7	3	14.9	12.9
Camden.....	39	17.1	7	123	17.1	5	15.6	16.4
Canton.....	20	9.7	4	100	11.7	2	10.6	11.4
Chicago.....	646	9.6	56	55	11.6	73	10.7	11.3
Cincinnati.....	141	16.0	10	64	15.5	16	15.7	18.8
Cleveland.....	190	10.8	16	52	10.4	20	11.3	11.1
Columbus.....	81	14.1	5	50	14.1	5	15.8	14.2
Dallas.....	60	11.1	5	13.6	6	11.4	13.7	12.6
White.....	51	11.4	4	11.8	4	10.4	12.6	19.1
Colored.....	9	9.7	1	22.0	2	16.5	19.1	13.1
Dayton.....	49	10.8	3	43	11.9	7	11.2	16.9
Denver.....	89	15.8	3	29	16.6	7	19.8	13.2
Des Moines.....	22	7.9	0	0	13.0	4	10.1	8.6
Detroit.....	269	8.2	30	54	8.3	22	8.5	13.8
Duluth.....	20	10.3	0	0	14.3	1	9.4	22.2
El Paso.....	35	17.1	7	22.8	10	16.0	11.8	12.5
Erie.....	19	8.3	1	21	12.8	2	10.5	8.0
Fall River.....	26	11.8	3	80	10.0	3	12.4	13.2
Flint.....	25	7.7	2	29	8.6	4	7.5	13.2
Fort Worth.....	29	8.9	0	12.1	6	10.5	12.1	18.5
White.....	25	9.1	0	11.5	6	9.3	12.1	10.0
Colored.....	4	7.8	0	15.3	0	17.0	18.5	12.8
Grand Rapids.....	17	8.1	1	17	12.1	10	7.0	12.1
Houston.....	72	11.6	10	12.8	8	11.7	12.8	14.2
White.....	57	12.5	9	9	7	10.8	14.9	14.2
Colored.....	15	9.1	1	20.7	1	14.2	13.7	18.1
Indianapolis.....	117	16.3	8	65	12.8	4	14.5	13.8
White.....	101	16.1	8	74	12.4	4	13.9	16.1
Colored.....	16	18.1	0	0	16.2	0	18.9	14.3
Jersey City.....	58	9.5	4	33	16.8	12	11.0	16.1
Kansas City, Kans.....	29	12.2	3	66	16.5	4	13.5	14.3
White.....	19	9.9	2	54	14.2	3	12.2	23.7
Colored.....	10	22.1	1	128	26.6	1	19.1	14.6
Kansas City, Mo.....	116	14.6	11	124	13.6	10	11.8	16.2
Knoxville.....	27	12.6	1	25	17.7	3	12.3	14.3
White.....	22	12.3	1	28	18.4	3	11.2	36.4
Colored.....	5	14.3	0	0	29.3	0	16.2	10.8
Long Beach.....	34	11.0	1	26	11.3	2	11.1	13.7
Los Angeles.....	343	13.0	11	53	12.9	30	12.9	20.0
Louisville.....	75	12.7	9	82	15.1	3	14.6	17.6
White.....	54	10.8	5	52	14.4	2	13.1	32.5
Colored.....	21	23.0	4	298	38.3	1	22.6	15.1
Lowell.....	26	13.6	3	78	18.7	4	13.9	13.6
Lynn.....	17	8.6	0	0	11.2	1	11.2	15.0
Memphis.....	92	18.3	13	142	20.3	20	17.9	15.7
White.....	46	14.8	6	85	17.6	9	13.8	21.9
Colored.....	46	23.9	8	241	24.8	11	25.4	11.3
Miami.....	35	16.1	2	56	9.3	1	15.0	11.4
White.....	23	13.6	1	39	7.2	0	13.8	11.0
Colored.....	12	24.5	1	101	16.6	1	19.3	11.0

See footnotes at end of table.

Deaths¹ from all causes in certain large cities of the United States during the week ended January 23, 1932, infant mortality, annual death rate, and comparison with corresponding week of 1931—Continued

City	Week ended Jan. 23, 1932				Corresponding week, 1931		Death rate ² for the first 3 weeks	
	Total deaths	Death rate ³	Deaths under 1 year	Infant mortality rate ⁴	Death rate ⁵	Deaths under 1 year	1932	1931
Milwaukee	106	9.2	7	33	10.3	16	9.6	10.3
Minneapolis	80	8.7	7	46	12.0	15	9.3	12.5
Nashville ⁶	36	12.0	3	45	18.1	4	13.1	16.5
White	26	11.9	3	59	13.0	3	12.8	14.2
Colored	10	12.2	0	0	20.7	1	13.8	22.7
New Bedford ⁷	25	11.6	2	58	12.0	4	12.1	13.3
New Haven	35	11.2	4	80	16.3	3	13.2	13.6
New Orleans ⁸	132	14.5	11	63	20.7	14	15.6	21.2
White	81	12.6	5	44	16.0	8	13.4	17.7
Colored	51	19.4	6	98	32.5	6	21.2	29.7
New York	1,385	10.0	123	55	16.5	176	11.0	15.4
Bronx Borough	203	7.7	14	40	12.3	28	8.5	11.0
Brooklyn Borough	461	9.0	44	49	15.4	68	9.8	14.5
Manhattan Borough	533	15.7	50	71	24.6	58	16.9	23.3
Queens Borough	145	6.3	12	50	11.3	21	7.1	10.3
Richmond Borough	43	13.4	3	59	14.7	1	14.9	14.5
Newark, N. J.	75	8.7	6	33	13.6	8	10.4	13.3
Oakland	62	10.8	2	25	12.1	7	11.8	13.7
Oklahoma City	44	11.2	9	123	11.4	7	11.1	11.9
Omaha	50	11.9	4	45	13.5	4	13.4	14.3
Paterson	41	15.4	5	91	12.4	2	15.4	14.3
Peoria	23	10.8	0	0	15.4	2	11.3	16.4
Philadelphia	456	12.0	29	45	19.3	44	12.8	17.1
Pittsburgh	163	12.5	13	59	16.9	26	13.6	16.7
Portland, Oreg.	71	11.9	2	26	14.3	0	13.5	14.6
Providence	62	12.6	5	48	14.5	11	16.4	15.1
Richmond ⁹	43	12.1	3	45	17.0	6	15.5	16.6
White	31	12.2	2	45	11.9	1	13.7	13.2
Colored	12	11.9	1	46	29.6	5	20.1	25.0
Rochester	83	13.0	7	67	13.2	4	12.6	13.1
St. Louis	218	13.7	5	18	16.9	21	15.1	16.6
St. Paul	55	10.3	4	43	10.0	3	9.8	11.0
Salt Lake City ¹⁰	33	11.9	0	0	11.7	1	11.9	13.2
San Antonio	54	11.4	3	—	16.9	16	13.8	16.4
San Diego	67	21.5	2	43	16.7	4	17.6	16.0
San Francisco	176	13.9	3	21	16.3	10	14.6	13.2
Schenectady	28	15.2	2	58	11.9	2	11.6	9.6
Seattle	82	11.4	5	50	11.4	6	11.9	13.5
Somerville	16	7.9	1	40	8.9	1	10.7	10.8
South Bend	20	9.4	2	58	11.1	3	8.8	7.6
Spokane	22	9.8	1	27	15.7	2	13.0	14.6
Springfield, Mass.	33	11.2	4	67	14.0	4	12.6	11.7
Syracuse	65	15.7	3	39	12.7	6	13.2	12.9
Tacoma	28	13.5	3	53	15.5	1	11.2	14.3
Tampa ¹¹	27	13.1	2	57	18.9	2	11.9	17.7
White	17	10.4	1	35	19.5	2	10.6	16.6
Colored	10	22.9	1	158	16.4	0	16.8	21.9
Toledo	72	12.5	5	54	14.2	6	11.9	12.6
Trenton	31	13.1	1	20	13.9	2	15.3	17.7
Utica	37	18.8	1	28	10.4	1	15.8	18.2
Washington, D. C. ¹²	143	15.1	13	73	18.9	13	15.6	18.7
White	94	13.8	6	49	16.6	6	14.0	16.4
Colored	49	18.7	7	125	25.1	7	19.8	24.8
Waterbury	21	10.8	2	66	12.4	3	9.1	9.3
Wilmington, Del. ¹³	25	12.3	3	68	14.7	6	14.7	14.7
Worcester	43	11.3	7	98	15.6	4	12.9	15.2
Yonkers	13	4.8	1	26	10.9	2	7.4	11.0
Youngstown	45	13.4	6	97	9.3	5	10.6	11.3

¹ Deaths of nonresidents are included. Stillbirths are excluded.

² These rates represent annual rates per 1,000 population, as estimated for 1932 and 1931 by the arithmetical method.

³ Deaths under 1 year of age per 1,000 live births. Cities left blank are not in the registration area for births.

⁴ Data for 78 cities.

⁵ Deaths for week ended Friday.

⁶ For the cities for which deaths are shown by color the percentages of colored population in 1930 were as follows: Atlanta, 33; Baltimore, 18; Birmingham, 38; Dallas, 17; Fort Worth, 16; Houston, 27; Indianapolis, 12; Kansas City, Kans., 19; Knoxville, 16; Louisville, 15; Memphis, 38; Miami, 23; Nashville, 28; New Orleans, 29; Richmond, 29; Tampa, 21; and Washington, D. C., 27.

⁷ Population Apr. 1, 1930; decreased 1920 to 1930, no estimate made.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended January 30, 1932, and January 31, 1931

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 30, 1932, and January 31, 1931

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931
New England States:								
Maine.....	6	1	459	26	654	48	1	0
New Hampshire.....	1	1		10	30	141	0	0
Vermont.....					197	12	0	0
Massachusetts.....	66	93	35	307	319	588	0	2
Rhode Island.....	11	7	1	21	787	1	0	0
Connecticut.....	6	11	3	176	179	242	1	0
Middle Atlantic States:								
New York.....	142	133	139	1,646	1,200	418	6	31
New Jersey.....	32	81	16	967	115	525	5	7
Pennsylvania.....	160	128			1,589	1,441	10	9
East North Central States:								
Ohio.....	159	120	60	72	500	250	5	8
Indiana.....	53	44	57	68	106	314	12	6
Illinois.....	129	153	52	480	75	886	8	8
Michigan.....	46	53	11	16	223	185	2	5
Wisconsin.....	18	35	19	111	181	335	3	2
West North Central States:								
Minnesota.....	11	15	1		21	56	0	0
Iowa.....	19	13			4	3	0	3
Missouri.....	55	54	4	86	38	830	5	7
North Dakota.....	1	1			5	25	0	2
South Dakota.....	10	31	3		61	8	0	0
Nebraska.....	10	13	46	20	21	12	0	1
Kansas.....	47	11	16	13	43	46	2	4
South Atlantic States:								
Delaware.....	4	1		82	1	8	0	0
Maryland.....	55	26	25	3,148	34	301	2	0
District of Columbia.....	18	11	1	52		27	2	3
Virginia.....								3
West Virginia.....	28	15	58	173	270	36	0	0
North Carolina.....	47	33	30	1,764	146	150	3	0
South Carolina.....	17	12	508	2,873	28	24	0	0
Georgia.....	21	10	84	323	5	52	1	1
Florida.....	13	3	2	46	9	65	0	0

¹ New York City only.

² Week ended Friday.

³ Typhus fever, week ended Jan. 30, 1932, 2 cases in North Carolina.

*Cases of certain communicable diseases reported by telegraph by State health officers
for weeks ended January 30, 1932, and January 31, 1931—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931
East South Central States:								
Kentucky.....	39	19			84	170	3	7
Tennessee.....	31	8	78	186	13	64	2	6
Alabama.....	24	24	72	305	5	529	2	6
Mississippi.....	20	21					1	6
West South Central States:								
Arkansas.....	7	3	27	156	2	1	0	1
Louisiana.....	46	49	19	117	20	2	1	7
Oklahoma.....	24	43	105	236	119	31	0	0
Texas.....	131	27	72	107	21	148	0	2
Mountain States:								
Montana.....	1		265		80	4	1	1
Idaho.....				5	1	1	0	1
Wyoming.....		1	4	1	2		0	1
Colorado.....	11	11			14	107	1	4
New Mexico.....	13	6	3	6	21	38	0	0
Arizona.....		6	32	10	2	72	2	3
Utah.....				6	1	3	1	1
Pacific States:								
Washington.....	8	10			383	67	6	3
Oregon.....	2	11	121	48	23	76	6	0
California.....	66	57	225	185	319	509	4	4

Division and State	Polioomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931
New England States:								
Maine.....	0	1	32	37	0	0	4	3
New Hampshire.....	0	0	30	1	0	1	3	0
Vermont.....	0	0	7	2	6	6	0	0
Massachusetts.....	0	1	499	375	2	0	3	4
Rhode Island.....	0	0	45	29	0	0	0	0
Connecticut.....	0	0	102	44	6	0	1	0
Middle Atlantic States:								
New York.....	7	1	965	743	4	3	21	7
New Jersey.....	1	0	220	292	0	0	5	1
Pennsylvania.....	0	1	617	656	0	1	23	11
East North Central States:								
Ohio.....	2	4	538	799	49	87	12	9
Indiana.....	0	1	117	402	25	105	1	3
Illinois.....	5	4	432	524	5	66	0	3
Michigan.....	2	1	331	45	3	53	10	7
Wisconsin.....	2	1	111	125	0	7	0	8
West North Central States:								
Minnesota.....	0	1	105	66	2	10	2	7
Iowa.....	0	2	67	150	81	55	2	0
Missouri.....	0	2	88	230	20	25	2	3
North Dakota.....	0	0	18	49	11	11	1	2
South Dakota.....	0	0	13	17	14	36	2	1
Nebraska.....	1	1	36	52	5	62	1	0
Kansas.....	0	1	67	56	3	160	2	1
South Atlantic States:								
Delaware.....	0	0	16	33	0	0	0	0
Maryland.....	1	0	129	112	0	0	4	5
District of Columbia.....	0	0	18	26	0	0	0	1
Virginia.....	1							
West Virginia.....	0	0	51	34	1	11	12	7
North Carolina.....	0	2	55	78	5	2	14	2
South Carolina.....	0	1	12	15	0	0	12	11
Georgia.....	0	0	17	60	0	0	11	8
Florida.....	0	0	4	14	2	0	3	1

¹ Week ended Friday.

² Typhus fever, week ended Jan. 30, 1932; 2 cases in North Carolina.

³ Figures for 1932 are exclusive of Oklahoma City and Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 30, 1932, and January 31, 1931—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931	Week ended Jan. 30, 1932	Week ended Jan. 31, 1931
East South Central States:								
Kentucky.....	0	0	108	150	4	16	23	8
Tennessee.....	0	0	62	39	16	5	17	5
Alabama.....	0	0	34	73	18	3	8	7
Mississippi.....	1	1	15	22	27	11	5	4
West South Central States:								
Arkansas.....	0	0	3	10	3	9	1	5
Louisiana.....	1	0	17	31	3	9	14	1
Oklahoma ¹	1	2	35	47	78	117	23	12
Texas.....	0	0	62	46	16	24	12	6
Mountain States:								
Montana.....	1	0	49	45	0	2	0	1
Idaho.....	0	0	7	10	2	1	0	2
Wyoming.....	0	0	11	26	0	0	1	0
Colorado.....	1	1	38	45	6	6	0	2
New Mexico.....	1	0	11	13	3	2	1	4
Arizona.....	0	1	8	10	0	0	1	2
Utah ¹	1	0	9	13	0	0	0	1
Pacific States:								
Washington.....	0	0	45	51	12	19	2	1
Oregon.....	0	0	30	27	8	38	1	1
California.....	1	6	123	160	8	128	1	7

¹ Week ended Friday.⁴ Figures for 1932 are exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Men-ingo-coccus menin-gitis	Diph-theria	Influ-enza	Ma-laria	Mea-sles	Pel-lagra	Polio-mye-litis	Scarlet fever	Small-pox	Ty-phoid fever
<i>November, 1931</i>										
Hawaii Territory.....	1	13	2		108				0	10
<i>December, 1931</i>										
California.....	25	438	532	4	746	5	20	687	39	35
Louisiana.....	5	155	60	46	22	34	1	94	6	98
Montana.....	2	4	14		541		5	162	18	4
Nevada.....		1	1				0	8	0	0
New York.....	38	571			1,995		66	2,133	59	99
Oklahoma ¹	4	319	150	40	13	7	2	181	7	47
Oregon.....		6	146		30		1	67	41	10
South Carolina.....		170	1,520	612	89	98	1	46	0	37
South Dakota.....		37	10		275		1	61	44	14
Texas.....	3	653	78	426		1	3	303		52
Virginia.....	3	738	1,097	9	185	14	3	557	8	98
Washington.....	8	34	54		524		5	195	91	12
Wisconsin.....	7	94	102		229		9	385	43	6

¹ Exclusive of Oklahoma City and Tulsa.

<i>November, 1931</i>			<i>December, 1931</i>		
Hawaii Territory:	Cases		Actinomycosis:	Cases	
Chicken pox.....	13		California.....	1	
Conjunctivitis, follicular.....	325		Anthrax: ¹		
Dysentery (bacillary).....	3		New York.....	1	
Hookworm disease.....	26		Chicken pox:		
Leprosy.....	6		California.....	1,608	
Mumps.....	5		Louisiana.....	6	
Tetanus.....	3		Montana.....	180	
Trachoma.....	101		Nevada.....	7	
Whooping cough.....	8		New York.....	2,190	

¹ Later report from California states case reported in November, published in Public Health Reports dated Jan. 15, 1932, p. 153, was not anthrax.

Chicken pox—Continued.	Cases	Mumps—Continued.	Cases
Oklahoma ¹	63	South Dakota.....	41
Oregon.....	217	Virginia.....	60
South Carolina.....	107	Wisconsin.....	860
South Dakota.....	152	Ophthalmia neonatorum:	
Virginia.....	508	New York.....	8
Washington.....	515	South Carolina.....	10
Wisconsin.....	1,772	South Dakota.....	3
Dengue:		Paratyphoid fever:	
Louisiana.....	1	California.....	5
South Carolina.....	2	New York.....	6
Diarrhea:		South Carolina.....	1
South Carolina.....	330	Texas.....	3
Diarrhea and dysentery:		Puerperal septicemia:	
Virginia.....	93	New York.....	10
Dysentery:		South Dakota.....	1
California (amoebic).....	9	Washington.....	1
California (bacillary).....	13	Rabies in animals:	
Louisiana.....	3	California.....	30
Montana.....	1	Louisiana.....	4
New York.....	10	New York ²	2
Oklahoma ¹	5	South Carolina.....	15
Oregon.....	1	Scabies:	
Food poisoning:		Montana.....	2
California.....	7	Oklahoma ¹	12
German measles:		Oregon.....	53
California.....	29	Washington.....	11
Montana.....	4	Septic sore throat:	
New York.....	77	California.....	7
Washington.....	12	Louisiana.....	3
Wisconsin.....	20	Montana.....	7
Giardia enterica:		New York.....	23
Montana.....	2	Oklahoma ¹	36
Granuloma, coccidioidal:		Oregon.....	9
California.....	1	South Carolina.....	7
Hookworm disease:		South Dakota.....	1
Louisiana.....	36	Tetanus:	
South Carolina.....	63	California.....	4
Impetigo contagiosa:		Louisiana.....	6
Montana.....	3	New York.....	8
Oklahoma ¹	1	South Dakota.....	1
Oregon.....	102	Trachoma:	
Washington.....	9	California.....	7
Jaundice:		Louisiana.....	1
California.....	1	New York.....	1
Leprosy:		Oklahoma ¹	3
California.....	1	South Dakota.....	1
Louisiana.....	4	Trichinosis:	
Lethargic encephalitis:		New York.....	2
California.....	2	Tularaemia:	
New York.....	6	California.....	1
Oregon.....	1	Oklahoma ¹	1
Washington.....	4	Virginia.....	13
Wisconsin.....	1	Wisconsin.....	3
Mumps:		Typhus fever:	
California.....	463	California.....	2
Louisiana.....	1	New York.....	3
Montana.....	10	South Carolina.....	6
Nevada.....	3	Undulant fever:	
New York.....	575	California.....	8
Oklahoma ¹	19	Louisiana.....	2
Oregon.....	84	New York.....	23
South Carolina.....	83	Oregon.....	1

¹ Exclusive of Oklahoma City and Tulsa.² Exclusive of New York City.

Undulant fever—Continued.	Cases	Whooping cough—Continued.	Cases
Virginia.....	3	Montana.....	48
Washington.....	6	Nevada.....	20
Wisconsin.....	3	New York.....	1,652
Vincent's angina:		Oklahoma ¹	25
Montana.....	1	Oregon.....	22
New York ¹	59	South Carolina.....	47
Oklahoma ¹	2	South Dakota.....	51
Oregon.....	18	Virginia.....	805
Whooping cough:		Washington.....	48
California.....	457	Wisconsin.....	840
Louisiana.....	21		

ADMISSIONS TO HOSPITALS FOR THE INSANE, JANUARY, 1930

Reports for the month of January, 1930, showing new admissions to hospitals for the care and treatment of the insane, were received by the Public Health Service from 117 hospitals, located in 39 States, the District of Columbia, and the Territory of Hawaii. The 117 hospitals had 184,913 patients on January 31, 1930, 98,836 males and 86,077 females, the ratio being 115 males per 100 females.

The following table gives the number of new admissions for the month of January, 1930:

Psychoses	Number of first admissions		
	Male	Female	Total
1. Traumatic psychoses.....	20	2	22
2. Senile psychoses.....	181	116	297
3. Psychoses with cerebral arteriosclerosis.....	188	90	278
4. General paralysis.....	211	69	280
5. Psychoses with cerebral syphilis.....	31	7	38
6. Psychoses with Huntington's chorea.....	3	0	3
7. Psychoses with brain tumor.....	3	0	3
8. Psychoses with other brain or nervous disease.....	22	11	33
9. Alcoholic psychoses.....	159	15	174
10. Psychoses due to drugs and other exogenous toxins.....	20	8	28
11. Psychoses with pellagra.....	11	12	23
12. Psychoses with other somatic diseases.....	32	39	71
13. Manic-depressive psychoses.....	208	245	453
14. Involution melancholia.....	12	49	61
15. Dementia praecox (schizophrenia).....	438	305	743
16. Paranoia and paranoid conditions.....	33	34	67
17. Epileptic psychoses.....	52	25	77
18. Psychoneuroses and neuroses.....	27	33	60
19. Psychoses with psychopathic personality.....	17	10	27
20. Psychoses with mental deficiency.....	63	48	111
21. Undiagnosed psychoses.....	141	91	232
22. Without psychosis.....	187	65	252
Total.....	2,050	1,274	3,333

During the month of January, 1930, there were 3,333 new admissions to the hospitals, 61.8 per cent of these new admissions being males and 38.2 per cent females, the ratio being 162 males per 100 females. Of the new admissions, 484 were reported as being undiagnosed or "without psychosis." There were 2,849 new admissions for which provisional diagnoses were made. Of these 2,849 patients, cases of dementia praecox constituted 26.1 per cent; manic-depres-

¹ Exclusive of Oklahoma City and Tulsa.

¹ Exclusive of New York City.

sive psychoses, 15.9 per cent; senile psychoses, 10.4 per cent; general paralysis, 9.8 per cent, and psychoses with cerebral arteriosclerosis, 9.8 per cent. These five classes accounted for 72 per cent of the new admissions for which diagnoses were made.

The following table shows the number of patients in the hospitals and on parole on January 31, 1930:

	Number of patients on books		
	Male	Female	Total
Patients on books last day of month:			
In hospitals.....	89,265	78,694	167,959
On parole or otherwise absent, but still on books.....	9,571	7,383	16,954
Total.....	98,836	86,077	184,913

Of the 184,913 patients, 9,571 males and 7,383 females were on parole at the end of the month—9.7 per cent of the males, 8.6 per cent of the females, and 9.2 per cent of the total number of patients.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 95 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 33,805,000. The estimated population of the 88 cities reporting deaths is more than 32,246,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended January 23, 1932, and January 24, 1931

	1932	1931	Estimated expectancy
<i>Cases reported</i>			
Diphtheria:			
46 States.....	1,627	1,335	-----
95 cities.....	632	508	886
Measles:			
46 States.....	7,230	7,992	-----
95 cities.....	2,248	2,491	-----
Meningococcus meningitis:			
46 States.....	71	132	-----
95 cities.....	37	58	-----
Poliomyelitis: 46 States.....	39	47	-----
Scarlet fever:			
46 States.....	5,055	5,453	-----
95 cities.....	1,947	2,133	1,516
Smallpox:			
46 States.....	603	990	-----
95 cities.....	33	103	54
Typhoid fever:			
46 States.....	255	148	-----
95 cities.....	47	40	34
<i>Deaths reported</i>			
Influenza and pneumonia: 88 cities.....	806	1,712	-----
Smallpox:			
88 cities.....	1	0	-----
Little Rock, Ark.....	1	0	-----

City reports for week ended January 23, 1932

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded, and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1923 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviation from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases re- ported	Mumps, cases re- ported	Pneu- monia, deaths reported
		Cases, estimated expect- ancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND								
Maine:								
Portland	2	1	0		0	197	1	
New Hampshire:								
Concord	0	0	0		0	0	0	
Manchester	0	1	0		0	0	0	
Nashua	1	0	0		0	0	0	
Vermont:								
Barre	0	0	0		0	0	0	
Burlington	4	1	0		0	50	3	
Massachusetts:								
Boston	61	34	17	4	0	15	30	14
Fall River	10	4	1		0	9	1	
Springfield	13	5	0		0	4	16	
Worcester	13	5	1		0	1	60	
Rhode Island:								
Pawtucket	0	1	0		0	0	0	
Providence	19	8	2		1	634	22	
Connecticut:								
Bridgeport	9	5	0	1	2	0	0	
Hartford		5						
New Haven	12	1	0	1	0	0	21	
MIDDLE ATLANTIC								
New York:								
Buffalo	33	12	6		2	8	0	
New York	211	203	151	20	8	28	75	
Rochester	9	6	1		0	78	12	
Syracuse	20	2	0		0	45	11	
New Jersey:								
Camden	4	5	1		0	1	0	
Newark	68	17	4		0	2	19	
Trenton	1	2	0	1	0	1	6	
Pennsylvania:								
Philadelphia	124	66	10	7	7	3	35	
Pittsburgh	56	18	12	3	1	182	66	
Reading	15	2	0		0	0	1	
EAST NORTH CENTRAL								
Ohio:								
Cincinnati	4	8	9		3	0	0	
Cleveland	158	30	7	14	1	181	135	
Columbus	8	3	13		2	1	0	
Toledo	51	0	2	1	1	1	2	
Indiana:								
Fort Wayne	3	4	11		0	0	0	
Indianapolis	44	6	3		2	0	46	
South Bend	6	1	0		0	0	0	
Terre Haute	2	0	1		0	0	0	
Illinois:								
Chicago	109	98	63	27	2	54	13	
Springfield	2	1	1		0	0	2	

City reports for week ended January 23, 1932—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued								
Michigan:								
Detroit	84	49	46	10	5	27	9	18
Flint	18	3	1		0	21	45	1
Grand Rapids	7	1	0		1	51	2	1
Wisconsin:								
Kenosha	7	1	1		0	0	1	1
Madison	8	1	0		0	1	2	2
Milwaukee	87	15	4	1	1	23	34	6
Racine	24	1	3		0	2	68	0
Superior	1	1	0		0	1	6	1
WEST NORTH CENTRAL								
Minnesota:								
Duluth	6	0	0		0	1	0	2
Minneapolis	29	15	6		0	2	28	8
St. Paul	21	4	0		0	1	1	0
Iowa:								
Davenport	0	1	0			0	1	
Des Moines	0	1	4			0	0	
Sioux City	5	0	4			0	0	
Waterloo	5	0	0			0	1	
Missouri:								
Kansas City	18	6	15		1	0	4	9
St. Joseph	3	2	1		0	0	1	6
St. Louis	14	41	9	1	0	2	0	11
North Dakota:								
Fargo	5	0	0		0	25	0	0
Grand Forks	1	1	0			3	0	
South Dakota:								
Aberdeen	5	0	0			10	0	
Sioux Falls	0	1	0			0	0	
Nebraska:								
Omaha	7	4	5		0	1	0	8
Kansas:								
Topeka	16	2	1		1	0	2	0
Wichita	40	2	13		0	47	1	3
SOUTH ATLANTIC								
Delaware:								
Wilmington	3	2	1		0	1	0	5
Maryland:								
Baltimore	104	22	11	16	4	2	52	29
Cumberland	1	1	0		0	0	0	2
Frederick	0	0	1		0	3	1	0
District of Columbia:								
Washington	20	17	19	1	0	3	0	12
Virginia:								
Lynchburg	9	1	1		0	0	0	1
Norfolk	10	2	4		0	0	0	4
Richmond	3	5	8		3	0	0	5
Roanoke	7	1	3		0	0	2	0
West Virginia:								
Charleston	6	2	2		0	9	0	0
Huntington	0		4		0	1	0	0
Wheeling	0	1	0		0	0	1	3
North Carolina:								
Raleigh	3	1	1		0	34	0	2
Wilmington	0	1	0		0	0	0	2
Winston Salem	17	1	2		0	0	3	3
South Carolina:								
Charleston	0	1	0	27	0	0	0	2
Columbia	0	0	0		0	1	0	8
Greenville	1	0	0			0	2	
Georgia:								
Atlanta	3	4	5	36	1	2	0	14
Brunswick	0	0	0		0	0	0	1
Savannah	1	2	0	12	3	1	0	4
Florida:								
Miami	1	2	4		0	1	0	2
Tampa	0	2	1		1	0	1	2

City reports for week ended January 23, 1932—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases re- ported	Mumps, cases re- ported	Pneu- monia, deaths reported
		Cases, estimated expect- ancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL								
Kentucky:								
Covington.....	2	1	0	0	0	0	1	1
Lexington.....	0		5	0	0	0	5	0
Tennessee:								
Memphis.....	4	4	9	3	1	0	0	9
Nashville.....	3	1	0	1	0	0	0	1
Alabama:								
Birmingham.....	3	3	4	3	2	1	2	4
Mobile.....	0	1	1	1	0	0	0	2
Montgomery.....	2	1	1	2		1	4	
WEST SOUTH CENTRAL								
Arkansas:								
Fort Smith.....	2	0	0			0	0	
Little Rock.....	0	1	0	0	0	0	1	2
Louisiana:								
New Orleans.....	0	14	23	3	1	0	0	14
Shreveport.....	0	2	1	1	0	40	1	5
Oklahoma:								
Tulsa.....	7	2	3			0	1	
Texas:								
Dallas.....	10	8	26		0	9	0	7
Fort Worth.....	6	5	5		0	2	0	0
Galveston.....	0	1	1		0	0	0	1
Houston.....	0	9	25		2	0	0	13
San Antonio.....	1	3	3		1	0	0	7
MOUNTAIN								
Montana:								
Billings.....	3	0	0		0	17	0	0
Great Falls.....	0	0	0		0	0	0	0
Helena.....	0	0	0		0	37	0	0
Missoula.....	0	0	0		0	0	0	0
Idaho:								
Boise.....		0						
Colorado:								
Denver.....	18	8	8		1	3	23	10
Pueblo.....	26	1	0		1	0	0	4
New Mexico:								
Albuquerque.....	11	1	2		0	1	0	1
Arizona:								
Phoenix.....								8
Utah:								
Salt Lake City.....	26	3	0		1	1	0	2
Nevada:								
Reno.....	0	0	0		0	0	0	1
PACIFIC								
Washington:								
Seattle.....	40	3	8			292	10	
Spokane.....	11	2	0			4	0	
Tacoma.....	7	4	1		0	2	1	8
Oregon:								
Portland.....	37	9	1	2	0	26	12	3
Salem.....	3	1	0	3		2	0	
California:								
Los Angeles.....	79	38	37	122	2	4	8	25
Sacramento.....	26	1	3		1	93	3	13
San Francisco.....	56	13	3	15	3	40	2	7

City reports for week ended January 23, 1932—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		
NEW ENGLAND											
Maine:											
Portland	3	4	0	0	0	1	0	0	0	3	37
New Hampshire:											
Concord	0	6	0	0	0	0	0	0	0	0	10
Manchester	2	5	0	0	0	0	0	0	1	0	31
Nashua	0	1	0	0	0	0	0	0	0	0	-----
Vermont:											
Barre	0	0	0	0	0	3	0	0	0	0	5
Burlington	1	1	-----	1	0	0	0	0	0	0	9
Massachusetts:											
Boston	97	154	0	0	0	8	1	1	0	24	215
Fall River	4	11	0	0	0	2	0	0	0	0	26
Springfield	9	10	0	0	0	0	0	0	0	9	37
Worcester	13	31	0	0	0	0	0	0	0	11	43
Rhode Island:											
Pawtucket	1	0	0	0	0	0	0	0	0	0	13
Providence	16	19	0	0	0	3	0	0	0	19	62
Connecticut:											
Bridgeport	10	8	0	3	0	2	1	0	0	0	40
Hartford	7	-----	0	-----	-----	0	-----	-----	-----	-----	-----
New Haven	7	16	0	0	0	1	0	0	0	15	35
MIDDLE ATLANTIC											
New York:											
Buffalo	27	70	0	0	0	6	1	0	0	29	140
New York	241	386	0	0	0	76	7	5	1	161	1,385
Rochester	11	54	0	0	0	1	0	0	0	2	79
Syracuse	15	24	0	0	0	1	1	0	0	78	65
New Jersey:											
Camden	7	24	0	0	0	1	0	0	0	3	39
Newark	28	27	0	0	0	4	1	0	0	39	76
Trenton	5	10	0	0	0	3	0	0	0	0	31
Pennsylvania:											
Philadelphia	101	158	0	0	0	18	2	1	0	317	456
Pittsburgh	36	64	0	0	0	8	1	3	1	42	163
Reading	4	0	0	0	0	3	0	0	0	11	30
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	24	39	1	1	0	6	0	1	0	5	141
Cleveland	45	62	1	0	0	11	2	1	0	141	190
Columbus	13	12	1	0	0	5	0	0	0	10	81
Toledo	15	5	1	0	0	6	0	0	0	62	72
Indiana:											
Fort Wayne	6	3	1	0	0	0	0	0	0	2	29
Indianapolis	12	10	5	1	0	2	0	0	0	31	-----
South Bend	4	3	0	0	0	1	0	0	0	1	20
Terre Haute	3	0	0	0	0	1	0	0	0	0	20
Illinois:											
Chicago	139	177	1	3	0	33	3	1	0	190	646
Springfield	3	5	0	0	0	2	0	0	0	15	27
Michigan:											
Detroit	112	142	2	0	0	16	0	2	0	114	269
Flint	14	13	1	0	0	0	0	0	1	9	25
Grand Rapids	14	7	0	0	0	1	0	0	0	3	17
Wisconsin:											
Kenosha	3	9	0	0	0	0	0	0	0	1	10
Madison	4	1	0	0	0	0	0	0	0	5	23
Milwaukee	37	41	0	0	0	3	0	0	0	181	106
Racine	6	1	0	0	0	0	0	0	0	1	15
Superior	3	0	0	0	0	0	0	0	0	0	8
WEST NORTH CENTRAL											
Minnesota:											
Duluth	11	5	0	0	0	2	0	0	0	0	20
Minneapolis	47	26	0	0	0	0	0	0	0	8	80
St. Paul	29	14	0	0	0	3	0	0	0	10	61

City reports for week ended January 23, 1932—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, esti- mated expec- tancy	Cases re- ported	Cases, esti- mated expec- tancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expec- tancy	Cases re- ported	Deaths re- ported		
WEST NORTH CENTRAL—continued											
Iowa:											
Davenport	1	16	2	1			0	0		0	
Des Moines	8	5	2	0			0	0		0	22
Sioux City	1	3	1	5			0	0		4	
Waterloo	1	0	0	0			0	1		9	
Missouri:											
Kansas City	19	22	1	0	0	11	0	0	0	49	116
St. Joseph	2	1	0	0	0	1	0	0	0	0	30
St. Louis	48	12	1	0	0	12	0	1	0	75	218
North Dakota:											
Fargo	3	2	1	0			0	0		0	
Grand Forks	0	0	0	0			0	0		0	
South Dakota:											
Aberdeen	0	1	0	4			0	0		4	
Sioux Falls	1	0	0	1			0	0		0	5
Nebraska:											
Omaha	7	4	2	2	0	2	0	6	0	0	50
Kansas:											
Topeka	3	3	1	0	0	0	0	0	0	23	10
Wichita	4	3	0	0	0	1	0	0	0	1	36
SOUTH ATLANTIC											
Delaware:											
Wilmington	7	8	0	0	0	1	0	0	1	6	25
Maryland:											
Baltimore	35	33	0	0	0	13	1	0	0	178	241
Cumberland	1	3	0	0	0	1	0	0	0	0	18
Frederick	0	2	0	0	0	0	0	0	0	6	4
District of Colum- bia:											
Washington	26	21	1	0	0	6	1	3	0	21	143
Virginia:											
Lynchburg	1	2	0	0	0	0	0	0	0	5	18
Norfolk	3	5	0	0	0	0	0	1	0	2	
Richmond	7	16	0	0	0	7	0	0	0	0	45
Roanoke	2	8	1	0	0	0	0	0	0	1	19
West Virginia:											
Charleston	2	3	0	0	0	2	0	1	0	2	13
Huntington		2		0	0	0	0	0	0	0	0
Wheeling	3	3	0	0	0	0	0	0	0	1	13
North Carolina:											
Raleigh	1	1	1	0	0	0	0	0	0	5	15
Wilmington	0	2	0	0	0	0	0	0	0	23	12
Winston-Salem	3	1	1	0	0	0	0	3	0	19	12
South Carolina:											
Charleston	1	0	0	0	0	0	0	0	0	0	17
Columbia	0	0	0	0	0	1	0	0	1	0	37
Greenville		1	0	0				0		3	
Georgia:											
Atlanta	5	7	0	0	0	3	0	0	0	2	72
Brunswick	0	0	0	0	0	0	0	0	0	0	6
Savannah	1	1	0	0	0	0	1	3	0	1	45
Florida:											
Miami	0	0	0	0	0	7	0	0	0	2	35
Tampa	1	0	0	0	0	1	1	5	0	1	26
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	4	1	0	0	0	0	0	0	2	17
Lexington		2		0	0	0		0	0	1	9
Tennessee:											
Memphis	8	9	2	3	0	8	1	0	0	24	92
Nashville	2	3	0	0	0	3	0	0	0	4	36
Alabama:											
Birmingham	6	1	1	0	0	5	0	0	0	0	50
Mobile	2	3	0	1	0	0	0	2	0	0	16
Montgomery	2	0	0	0			1	0	0	0	

City reports for week ended January 23, 1932—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culo- sis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith.....	1	0	0	0			0	0		1	
Little Rock.....	2	0	0	0	1	5	0	1	0	2	
Louisiana:											
New Orleans.....	7	8	0	0	0	10	3	2	2	3	132
Shreveport.....	1	1	0	0	0	3	0	0	0	2	31
Oklahoma:											
Tulsa.....	2	3	0	0			0	0		0	
Texas:											
Dallas.....	7	12	1	0	0	5	0	1	1	4	60
Fort Worth.....	4	4	0	1	0	1	1	0	0	0	29
Galveston.....	1	0	0	0	0	2	0	0	0	0	16
Houston.....	4	3	5	0	0	5	0	2	0	0	72
San Antonio.....	3	1	1	0	0	9	0	1	1	0	54
MOUNTAIN											
Montana:											
Billings.....	0	0	0	0	0	0	0	0	0	0	1
Great Falls.....	5	2	1	0	0	0	0	0	0	0	6
Helena.....	0	0	3	0	0	0	0	0	0	0	6
Missoula.....	0	4	0	0	0	0	0	0	0	0	2
Idaho:											
Boise.....	2		0				0				
Colorado:											
Denver.....	14	15	0	0	0	6	0	0	0	7	90
Pueblo.....	2	1	0	0	0	0	1	0	0	2	10
New Mexico:											
Albuquerque.....	1	2	0	0	0	0	0	0	0	0	9
Arizona:											
Phoenix.....	0		0		0	4	0		0		25
Utah:											
Salt Lake City.....	5	6	1	0	0	1	0	0	0	1	33
Nevada:											
Reno.....	0	1	0	0	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle.....	12	13	2	1			1	2		5	
Spokane.....	8	0	4	2			0	0		0	
Tacoma.....	4	3	2	0	0	0	0	0	0	2	28
Oregon:											
Portland.....	6	0	8	4	0	1	1	1	0	4	71
Salem.....	0	0		0				0		0	
California:											
Los Angeles.....	41	41	4	6	0	26	2	0	0	14	343
Sacramento.....	2	2	1	0	0	4	0	2	0	0	47
San Francisco.....	22	8	2	5	0	7	1	2	0	1	176

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston.....	0	0	0	0	0	0	1	2	1
Worcester.....	0	0	0	0	0	0	0	2	0
Rhode Island:									
Providence.....	0	0	1	0	0	0	0	0	0

City reports for week ended January 23, 1932—Continued

Division, State, and city	Meningo-coccus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
MIDDLE ATLANTIC									
New York:									
New York.....	2	1	0	2	0	0	1	1	0
Syracuse.....	1	0	0	0	0	0	0	0	0
New Jersey:									
Newark.....	0	0	0	0	0	0	0	1	0
Trenton.....	0	0	1	0	0	0	0	0	0
Pennsylvania:									
Philadelphia.....	5	2	0	0	0	0	0	0	0
Pittsburgh.....	2	1	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland.....	2	1	0	0	0	0	0	0	0
Columbus.....	1	0	0	0	0	0	0	0	0
Indiana:									
Indianapolis.....	5	2	0	0	0	0	0	0	0
Illinois:									
Chicago.....	6	3	0	0	0	0	0	1	1
Michigan:									
Detroit.....	2	1	0	0	0	0	1	1	0
Flint.....	1	1	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee.....	1	0	0	0	0	0	0	0	0
Racine.....	1	1	1	1	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis.....	0	0	0	0	0	0	0	1	0
Missouri:									
Kansas City.....	1	0	0	1	0	0	0	0	0
St. Louis.....	0	0	1	1	0	0	0	0	0
South Dakota:									
Aberdeen.....	0		0		0		0	1	
SOUTH ATLANTIC									
Maryland:									
Baltimore.....	2	0	0	0	0	0	0	0	0
Cumberland.....	1	1	0	0	0	0	0	0	0
North Carolina:									
Winston-Salem.....	0	0	0	0	1	0	0	0	0
South Carolina:									
Charleston.....	0	0	0	0	2	0	0	0	0
Columbia.....	0	0	0	0	0	1	0	0	0
Georgia:									
Savannah.....	1	0	0	0	2	0	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis.....	1	0	0	0	0	0	0	0	0
Alabama:									
Birmingham.....	0	0	0	0	1	1	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans.....	0	0	0	0	0	0	0	1	0
Texas:									
Fort Worth.....	0	0	0	0	0	1	0	0	0
Houston.....	0	2	0	0	0	0	0	0	0
MOUNTAIN									
New Mexico:									
Albuquerque.....	0	1	0	0	0	0	0	0	0
Utah:									
Salt Lake City.....	0	1	0	0	0	0	0	0	0
PACIFIC									
California:									
Los Angeles.....	1	1	0	0	0	0	0	0	0
San Francisco.....	1	1	0	0	0	0	1	0	0

The following table gives the rates per 100,000 population for 98 cities for the 5-week period ended January 23, 1932, compared with those for a like period ended January 24, 1931. The population figures used in computing the rates are estimated mid-year populations for 1931 and 1932, respectively, derived from the 1930 census. The 98 cities reporting cases have an estimated aggregate population of more than 34,000,000. The 91 cities reporting deaths have more than 32,400,000 estimated population.

*Summary of weekly reports from cities, December 20, 1931, to January 23, 1932—
Annual rates per 100,000 population, compared with rates for the corresponding period of 1930-31*¹

DIPHTHERIA CASE RATES

	Week ended—									
	Dec. 26, 1931	Dec. 27, 1930	Jan. 2, 1932	Jan. 3, 1931	Jan. 9, 1932	Jan. 10, 1931	Jan. 16, 1932	Jan. 17, 1931	Jan. 23, 1932	Jan. 24, 1931
98 cities.....	72	71	72	80	83	81	88	74	98	79
New England.....	65	75	81	116	79	79	86	91	85	106
Middle Atlantic.....	57	47	56	68	50	63	82	56	82	67
East North Central.....	69	102	64	91	76	96	68	95	97	93
West North Central.....	134	54	130	83	131	98	106	82	102	84
South Atlantic.....	99	86	71	62	114	85	94	69	108	85
East South Central.....	111	84	100	72	162	117	81	70	87	79
West South Central.....	115	143	129	136	204	142	195	108	260	81
Mountain.....	26	62	44	62	121	35	43	52	72	35
Pacific.....	41	40	64	55	65	61	97	47	99	88

MEASLES CASE RATES

98 cities.....	126	181	191	281	300	351	278	324	347	405
New England.....	945	305	1,207	268	1,706	490	1,905	310	2,235	522
Middle Atlantic.....	66	70	93	101	146	178	116	158	154	251
East North Central.....	32	27	93	55	142	62	182	87	215	80
West North Central.....	50	1,277	38	1,894	157	2,156	78	1,829	150	1,984
South Atlantic.....	14	124	79	322	53	435	71	500	110	806
East South Central.....	17	323	29	921	17	869	6	1,004	17	705
West South Central.....	41	24	64	24	43	20	73	7	162	10
Mountain.....	339	229	513	317	1,172	226	517	374	518	757
Pacific.....	259	16	445	24	784	33	544	55	828	73

SCARLET FEVER CASE RATES

98 cities.....	187	222	226	231	274	277	315	316	301	334
New England.....	389	353	539	327	549	433	582	539	673	575
Middle Atlantic.....	205	190	240	229	286	242	380	282	361	314
East North Central.....	227	285	233	261	298	363	335	398	312	394
West North Central.....	126	246	115	238	229	297	220	321	180	323
South Atlantic.....	107	178	221	262	227	277	239	305	218	343
East South Central.....	157	341	112	299	225	399	121	470	116	487
West South Central.....	41	59	108	108	69	68	99	129	82	142
Mountain.....	113	379	209	220	336	322	259	331	259	357
Pacific.....	61	85	109	73	141	73	129	73	128	120

¹ The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1932, and 1931, respectively.

² Spokane, Wash., not included.

³ Fort Wayne, Ind., not included.

⁴ Hartford, Conn., and Boise, Idaho, not included.

⁵ Columbia, S. C., not included.

⁶ Hartford, Conn., not included.

⁷ Boise, Idaho, not included.

Summary of weekly reports from cities, December 20, 1931, to January 23, 1932—
Annual rates per 100,000 population, compared with rates for the corresponding
period of 1930-31—Continued

SMALLPOX CASE RATES

	Week ended—									
	Dec. 26, 1931	Dec. 27, 1930	Jan. 2, 1932	Jan. 3, 1931	Jan. 9, 1932	Jan. 10, 1931	Jan. 16, 1932	Jan. 17, 1931	Jan. 23, 1932	Jan. 24, 1931
98 cities.....	4	7	23	7	6	13	24	16	25	26
New England.....	14	0	12	0	26	0	2	0	28	0
Middle Atlantic.....	0	0	0	0	0	0	0	0	0	0
East North Central.....	4	2	7	5	1	15	21	10	3	21
West North Central.....	10	43	4	46	6	63	17	96	13	77
South Atlantic.....	0	0	0	0	0	2	0	0	0	24
East South Central.....	0	0	0	0	23	6	12	18	23	29
West South Central.....	7	17	0	17	26	37	16	27	0	34
Mountain.....	0	35	9	9	9	9	9	78	70	9
Pacific.....	8	20	26	10	19	18	8	29	27	20

TYPHOID FEVER CASE RATES

98 cities.....	6	7	25	5	4	4	25	5	27	26
New England.....	2	2	12	2	2	5	0	0	23	2
Middle Atlantic.....	4	3	3	4	5	2	4	2	4	3
East North Central.....	2	12	4	4	2	2	12	2	3	3
West North Central.....	4	6	2	2	2	0	2	4	4	10
South Atlantic.....	14	16	6	4	8	10	18	10	29	24
East South Central.....	12	18	35	48	0	12	29	53	12	12
West South Central.....	44	0	3	3	13	20	10	14	23	27
Mountain.....	0	9	0	18	9	17	9	9	10	17
Pacific.....	4	6	28	6	4	2	0	2	11	6

INFLUENZA DEATH RATES

91 cities.....	9	11	13	16	18	24	24	36	22	22
New England.....	7	2	2	7	10	5	19	10	28	12
Middle Atlantic.....	7	10	5	17	12	29	12	59	8	91
East North Central.....	5	7	10	7	14	12	25	9	10	18
West North Central.....	3	9	9	3	9	21	3	18	6	29
South Atlantic.....	12	24	18	20	35	28	12	42	24	38
East South Central.....	32	19	25	26	31	45	44	64	44	64
West South Central.....	24	32	45	93	30	76	30	79	13	83
Mountain.....	70	0	131	18	103	44	103	35	27	44
Pacific.....	7	17	14	10	23	22	26	10	14	22

PNEUMONIA DEATH RATES

91 cities.....	101	126	121	164	144	187	226	219	220	229
New England.....	94	119	91	160	165	113	103	159	109	178
Middle Atlantic.....	101	126	126	184	148	233	133	311	126	332
East North Central.....	77	94	84	103	104	110	282	124	79	126
West North Central.....	118	117	103	180	131	200	119	212	154	171
South Atlantic.....	132	174	174	230	196	267	208	237	186	281
East South Central.....	113	149	140	207	169	267	132	220	107	299
West South Central.....	131	189	152	199	128	238	148	228	165	245
Mountain.....	226	194	165	264	263	244	181	270	152	157
Pacific.....	89	135	175	135	167	134	158	118	123	108

² Spokane, Wash., not included.

³ Fort Wayne, Ind., not included.

⁴ Hartford, Conn., and Boise, Idaho, not included.

⁵ Columbia, S. C., not included.

⁶ Hartford, Conn., not included.

⁷ Boise, Idaho, not included.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Weeks ended January 9 and 16, 1932.—The Bureau of Pensions and National Health of Canada reports cases of certain communicable diseases for the weeks ended January 9 and 16, 1932, as follows:

WEEK ENDED JANUARY 9, 1932

Province	Cerebro-spinal fever	Dysentery	Influenza	Lethargic encephalitis	Poliomyelitis	Small-pox	Typhoid fever
Prince Edward Island ¹							
Nova Scotia	1		7				
New Brunswick							1
Quebec ²						2	7
Ontario							1
Manitoba						10	1
Saskatchewan							
Alberta ¹						2	1
British Columbia	1						
Total	2		7			14	11

WEEK ENDED JANUARY 16, 1932

Province	Cerebro-spinal fever	Dysentery	Influenza	Lethargic encephalitis	Poliomyelitis	Small-pox	Typhoid fever
Prince Edward Island ¹							1
Nova Scotia			5				3
New Brunswick							
Quebec ²	2		1	1	1	3	3
Ontario							5
Manitoba						21	1
Saskatchewan					1		
Alberta						1	
British Columbia		2					
Total	2	2	6	1	2	25	13

¹ No case of any disease included in the table was reported during the week.

² No report received for the week.

Ontario—Communicable diseases—Comparative—Four weeks ended December 26, 1931.—Certain communicable diseases were reported in the Province of Ontario, Canada, for the four weeks ended December 26, 1931, and the corresponding period of the year 1930, as follows:

Disease	1930		1931	
	Cases	Deaths	Cases	Deaths
Cerebrospinal meningitis.....	2	5	4	2
Chancroid.....			8	
Chicken pox.....	1,196		898	
Diphtheria.....	355	14	274	11
Dysentery.....	1	1	2	
Erysipelas.....	1		6	
German measles.....	26		23	
Gonorrhoea.....	172		298	
Influenza.....	14	4	5	2
Jaundice.....			24	
Lethargic encephalitis.....			1	1
Measles.....	83		2,428	3
Mumps.....	448		464	1
Paratyphoid fever.....			6	
Pneumonia.....		126		107
Polioomyelitis.....	9		2	
Scarlet fever.....	612	1	468	
Smallpox ¹	4		6	
Septic sore throat.....	296	5	14	1
Syphilis.....	143		193	
Trench mouth.....			2	
Tuberculosis.....	136	29	209	29
Tularaemia.....			1	
Typhoid fever.....	50	2	53	2
Undulant fever.....	2		4	
Whooping cough.....	338	4	578	1

¹ The following municipalities reported cases of smallpox during the period: Ottawa, 2; Ernestown, 3; and East York, 1.

Quebec Province—Communicable diseases—Week ended January 23, 1932.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the week ended January 23, 1932, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis.....	1	Polioomyelitis.....	3
Chicken pox.....	100	Puerperal septicaemia.....	3
Diphtheria.....	66	Scarlet fever.....	81
Erysipelas.....	2	Smallpox.....	1
German measles.....	18	Typhoid fever.....	5
Measles.....	319	Whooping cough.....	54
Ophthalmia neonatorum.....	1		

Quebec Province—Vital statistics—April–July, 1931.—Births, deaths, and marriages for the months of April to July, 1931, in the Province of Quebec, Canada, with deaths from certain specified causes, are shown in the following tables:

	April	May	June	July
Estimated population.....	2,782,500	2,782,500	2,782,500	2,782,500
Births.....	6,793	7,024	6,776	6,761
Birth rate per 1,000 population.....	29.7	29.7	29.6	28.6
Deaths.....	2,863	2,721	2,439	2,531
Death rate per 1,000 population.....	12.5	11.5	10.7	10.7
Marriages.....	1,351	1,213	2,486	1,686
Deaths under 1 year.....	754	674	531	650
Deaths under 1 year per 1,000 births.....	111.0	96.0	79.1	96.1

Deaths from certain causes in Quebec Province

Cause of death	April	May	June	July
Cancer.....	193	160	197	171
Cerebrospinal meningitis.....	2			
Diabetes.....	36	22	31	28
Diarrhea.....	137	124	119	266
Diphtheria.....	26	11	19	19
Heart disease.....	305	341	263	272
Influenza.....	116	54	30	11
Lethargic encephalitis.....		2		
Measles.....	9	15	8	6
Nephritis.....	188	155	149	140
Polio-myelitis.....		1	1	2
Puerperal state.....	32	35	32	24
Scarlet fever.....	12	9	13	4
Syphilis.....	11	21	11	15
Traffic.....	17	36	50	46
Tuberculosis, pulmonary.....	236	211	200	195
Tuberculosis, other forms.....	68	77	65	66
Typhoid fever.....	18	16	11	11
Violence.....	74	96	127	194
Whooping cough.....	29	32	14	15

CHILE

Typhus fever on vessel.—According to a recent report, one case of typhus fever occurred in a member of the crew of the steamship *Canelos*, a small coasting vessel running from Iquique and points north to the south of Chile. The patient was removed to an isolation hospital in Antofagasta on December 28, and the disease was found to be typhus fever on December 31, 1931.

PORTO RICO

San Juan—Communicable diseases—Four weeks ended January 2, 1932.—During the four weeks ended January 2, 1932, cases of certain communicable diseases were reported in San Juan, Porto Rico, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis.....	1	Paratyphoid fever.....	1
Diphtheria.....	5	Polio-myelitis.....	1
Malaria.....	56	Tetanus, infantile.....	1
Measles.....	97	Typhoid fever.....	5
Mumps.....	3	Whooping cough.....	20
Ophthalmia neonatorum.....	2		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place	July 26- Aug. 22, 1931	Aug. 23- Sept. 19, 1931	Sept. 20- Oct. 17, 1931	Week ended									
				October, 1931		November, 1931				December, 1931			
				24	31	7	14	21	28	5	12	19	26
Ceylon: Colombo.....	C	3							1	1			
China:	D	3							1	1			
Canton.....	C												
Hankow.....	C		2										
Shanghai.....	D	7	125	8	18	1		6	5	3			
Sswatow.....	D		9	8				4	1	1			
India:	D		13	4									
Bombay.....	C	36,514	26,705	4,237	4,419	3,648	3,418	3,451	3,302				
Calcutta.....	D	20,276	13,257	2,252	2,360	2,400	1,789	1,744	1,713				
Chittagong.....	D	44	42	4	1	1			3				
Karikal.....	D	25	17	3	1	1			4				
Madras.....	D	110	46	51	14	19	28	22	19	11	22	11	19
Negapatam.....	D	30	15	23	9	4	10	14	10	6	15	6	8
Rangoon.....	D	1	1	1					11	6	8	5	6
Siam.....	C	2	2										
Sri Lanka.....	D	1	1										
Tientsin.....	D	6	6										
Yokohama.....	D	1	1										
India (French):	D	1	1	1	1	1							
Chanderagor.....	D	7	2	1	1								
Pondicherry.....	D	3	4	1									
India (Portuguese):	D	2	2	75	18	20	9	1	2	1			
Goa.....	D	2	18	26	3	6	1	1	2	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

[illegible]

Place	July, 1931	August, 1931	Sep- tember, 1931	October, 1931			November, 1931			December, 1931		
				1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-31
Persia: ¹												
Abadan.....	1	3	16	3	9	37	1					
Ahwaz.....	12	84	21	8	7	31	1					
Khorramabad.....	7	60			16	80	45	2	1			
Mohammerah.....					10	10	65	30	9	1		
Philippine Islands: ¹	1											
Provinces—												
Capiz.....												
Cebu.....	35	7	5		4	16	7	13	4	4	5	13
Siam.....	16	5	4		4	10	5	10	3	3		10
Ayudhya Province.....	3											
Bangkok.....	1						1					
On vessel:												
S. S. Cathay, at Kobe, Japan, from Shang- hai.....	4										1	1
S. S. Kasagi Maru, at Moji, from Shanghai.....	1											
S. S. Ankoo, at Nagasaki, from Shanghai.....	2											
Cochin-China ¹	1											
Indo-China (French) (see also table above):												
Cambodia ¹	C	241	12	14	1	16	2	3			2	1
Cochin-China ¹	D	60	2	7	1	16	1		1		1	1
Cochin-China ¹	C	143	39	18	11	2	1	5	1	8	3	3
Cochin-China ¹	D	42	32	13	10	2	1	4		5	2	

¹ On Oct. 23, 1931, cholera was reported at Mohammerah, Abadan, and Ahwaz, Persia. During the period from Oct. 22 to Nov. 7, 1931, 141 cases and 97 deaths were reported.

² Figures for cholera in the Philippine Islands are subject to correction.

³ Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place	July 26-Aug. 22, 1931	Aug. 23-Sept. 19, 1931	Sept. 20-Oct. 17, 1931	Week ended—									
				October, 1931			November, 1931			December, 1931			
				24	31	7	14	21	28	5	12	19	26
Algeria:													
Algiers.....	C	2											
Philippeville.....	D	2											
Argentina: Cordoba Provinces. ¹		1											
Azores:													
San Miguel Island.....	C							2	3				
Tercera Island.....	C							1	1				
Belgian Congo.....	C							9	7				
British East Africa (see also table below):								4	2				
Tanganyika.....	D												
Uganda.....	C	8	4	13									
Canary Islands: Palma Island—Los Llanos.....	C	2	4	6									
Ceylon: Colombo.....	D	285	280	276	71	87	60	41	38	31			
Chile:		281	207	270	69	84	58	39	35	30			
Santiago.....	D	6	3	4									
Plague-infected rats.....	D	6	3	3									
China:		8											
Santiago.....	C			1									
Plague-infected rats.....	D			1									
China:													
Shanghai.....	C												
Shanghai Province.....	C												
Dutch East Indies:													
Batavia and West Java.....	C	58	65	113	28	34	38	30	44	30	40	76	
Java and Madura.....	D	205	223	325	97	133	132	180	162	171	107	212	179

Ecuador (see table below).

Egypt:

Alexandria.....

Assiout.....

Beheln.....

Dakahlia.....

Girga.....

Kena.....

Minieh.....

Port Said.....

Tanta.....

France: Rouen-Devilleles.....

Hawaii Territory:

Hawaii-Hamakua-Plague-infected rats.....

Maui Island.....

Halimalie-Plague-infected rats.....

Kula District.....

Makawao-Plague-infected rats.....

Pala-Plague-infected rats.....

Pasaulo-Plague-infected rats.....

India.....

Bassein.....

Bombay.....

Plague-infected rats.....

Madras Presidency.....

Moulmein.....

Rangoon.....

Plague-infected rats.....

110 cases of bubonic plague were reported in Cordoba Province, Argentina, in January, 1932. They were distant from railroad and 500 kilometers from ports.

2 On July 27, 1931, 1,286 cases of plague were reported in Chibole and Changchow, China, since April. On Sept. 19, 1931, 18 deaths were reported in Changchunapu and new cases in Kaling and Fengtien.

3 On Oct. 17, 1931, plague epidemic was reported in western Shansi Province, China, with 2,000 deaths at Hsinghsien.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

[illegible]

[illegible]

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

(C indicates cases; D, deaths; P, present)

[illegible]

Place	July, 1931		August, 1931		September, 1931			October, 1931			November, 1931			December, 1931			Jan. 1-10, 1932
	June, 1931	July, 1931	August, 1931	September, 1931	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-31	
Rumania (see table below).																	
Siam.....																	
Spain.....																	
Straits Settlements.....																	
Sudan (Anglo-Egyptian).....																	
Syria (see table below).																	
Turkey (see table below).																	
Union of Socialist Soviet Republics (see table below).																	
Union of South Africa:																	
Cape Province.....																	
Natal.....																	
Orange Free State.....																	
Transvaal.....																	
Upper Volta.....																	
On vessel:																	
Brazilian ship Jabotao at New Orleans from Brazil.....																	
S. S. Taif (pilgrim ship) at Suakin from Jeddah.....																	
S. S. Bellasco at Mobile from Habana, Cuba, and Hull, England.....																	
Indo-China (see also table above).....																	
Ivory Coast.....																	
Syria: Beirut.....																	
China: Harbin.....																	
Chosen.....																	
France.....																	
Greece.....																	

1 Imported case.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

[illegible]

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

(C indicates cases; D, deaths; P, present)

[illegible]

